Meridian 1

Option 11C

Planning and Installation Guide

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Revision history

January 2002

Standard 7.00. This global document is up-issued to include updates and changes required for Release 25.40.

December 2000

Issue 6.00, Standard. This global document is up-issued to include updates and changes required for Option 11C IP Expansion with Release 25.3x software.

April 2000

Issue 5.00, Standard. This guide combines the three Option 11C Planning and Installation guides for the UK, *NTP 553-3021-210UK*, Europe, *NTP 553-3021-210EU* and North America, *NTP 553-3021-210*, into one global document for Release 25.0x.

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This guide is reissued to include X11 Release 23.30 information and other miscellaneous updates.

October 1997

Issue 2.0, Standard

The *General Information and Planning Handbook (553-3021-200)*, Standard 1.0 and the *Installation Guide (553-3021-210)*, Standard 1.0 were combined to form the ***Planning and Installation Guide***. Also contained were sections (those pertaining to a **new** installation) from the *Software Installation Program Guide (553-3021-310)*, Standard 1.0. Updates and requirements for Release 23 (ISM changes) were also included.

July 1996

Issue 1.0, Standard

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About this guide

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described is supported in your area.

The *Option 11C Planning and Installation* (553-3021-210) is intended for Meridian 1 Option 11C new system planning and installation personnel.

This Nortel Networks Publication (NTP) is a useful reference tool for first-time installations as it provides valuable information for the planning and installation of the Option 11C system. The planning chapters describe the general design, features, limits, and site requirements of the Option 11C system. The installation chapters give complete installation instructions and outline the process of installing a new Option 11C main cabinet system and expansion cabinets, if required.

IMPORTANT

If performing a new installation of an Option 11C system, follow the procedures described in this guide. If upgrading from an Option 11 or 11E to an Option 11C system, follow the steps outlined in the *Option 11C and 11C Mini Upgrade Procedures* (553-3021-250). Detailed technical information is contained in the optional *Option 11C and 11C Mini Technical Reference Guide* (553-3011-100)

Overview of the Option 11C

Contents

This section contains information on the following topics:

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Reference list

The following are the references in this section:

- *Set-Based Administration* (553-3001-303)

General information

This chapter provides an overview of the Option 11C system for first-time installations. It covers general design and features as well providing unique system information.

Design and architecture

The Option 11C is a small wall- or floor-mounted digital system which can be configured as a system with up to five cabinets.

Up to four expansion cabinets can be connected to the main cabinet using fiber optic cable or 100BaseT/F cable. The expansion cabinets can be located up to 3 km (1.8 mi.) from the main cabinet. With the introduction of IP connectivity, IP expansion cabinets can now be distributed over a campus data network.

Call processing, serial ports and network traffic are handled by an MC68040 processor located on the Small System Controller (SSC) card in the main cabinet. Performance is significantly increased in comparison with previous Option 11 systems.

The Option 11C uses global software found in other members of the Meridian 1 family. It can be configured as a key system or as a Private Branch Exchange (PBX).

Line cards and trunk cards used in the Option 11C are the same as those used in other Meridian 1 systems, with the addition of some specially designed cards used in the Option 11C system.

The Option 11C can be configured as a non-blocking system as it does not need to be provisioned for speech paths or timeslots.

Easy to install and program

The system is shipped with a Software Daughterboard which is pre-configured with system and customer data.

The Software Installation Program is automatically invoked during first-time installation of the Option 11C system. This is a menu driven program which installs the software and makes the Option 11C operational.

Model telephones

The user has a variety of pre-programmed model telephone layouts from which to choose. Using telephone layouts or templates, technicians can perform a few simple steps at installation to activate multiple telephones.

Administration telephone

If the default model layouts for telephones and trunk routes are used, an administrative telephone is all that is required to make adjustments to such things as the numbering plan and access codes. A TTY input terminal is not required for programming the Option 11C unless a custom layout is used.

The telephone used for administrative functions can be an M2616 or M2008 digital telephone. This phone can also double as a user's working telephone.

Changing or removing pre-programmed data

If the pre-programmed data is not applicable to users at a particular site, the data can be revised on-site with a TTY, or remotely over a modem connection. If desired, the user can start with the minimal amount of data required for initial software programming which is the configuration record. This step must be performed while the user is in the Software Installation Program.

Set-Based Administration

The Set-Based Administration feature simplifies system installation and administration by enabling a telephone set to perform several administrative and maintenance procedures. Examples such as changing data associated with specific set-related features, or changing Calling Party Name Display on a particular set, can be performed through the Set-Based Administration feature.

For more information about Set-based Administration, refer to *Set-Based Administration* (553-3001-303).

Multiple-terminal access

The Option 11C allows a total of five users access to log in, load, and execute overlays simultaneously. For example, if you have expansion cabinets, users can access the system through the Main or Expansion cabinets at the same time.

Three Serial Data Interface (SDI) ports are provided on the Main cabinet's Small System Controller (SSC) card, while each expansion cabinet can be accessed through three SDI ports on the SSC card of each IP Expansion cabinet. One SDI port is available on each Expansion cabinet Fiber Receiver card.

The advantage of multiple-terminal access is that it allows for more efficient programming and maintenance of the Option 11C, especially when system cabinets are located up to 3 km (1.8 MI) apart.

Meridian Mail

The specially designed Meridian Mail comes pre-configured with mailboxes already setup for pre-programmed extensions. If the numbering plan is being modified, then the mailboxes can be changed from any TTY used for Option 11C administration.

Fully featured

The Option 11C may be configured with software applications such as Automatic Call Distribution, Voice Mail, Automatic Route Selection, Automatic Set Relocation, and Attendant Administration.

The Meridian Mail application comes equipped standard with features like Voice Menus, Automated Attendant, and Hospitality Voice Services.

Meridian Mail Networking is available on advanced Meridian Mail systems.

There is a choice of software available offering everything from General Business features to Advanced Applications. First-time installations are performed from the Software Daughterboard that is initially provided with the new system. Upgrades to new software releases are performed using a Software Delivery card (PCMCIA card).

Option 11C with IP Connectivity

Option 11C IP Expansion provides IP interconnection between Option 11C main and expansion cabinets. This IP interconnection enables:

- Increased Digital Trunking Capacity
- Survivable Expansion Cabinets
- Voice Distribution over Campus Data Network

The solution is applicable to Option 11C and Option 11C Mini systems.

Increased Digital Trunking/SDI Capacity

This development provides increased networking capacity for the Option 11C and Option 11C Mini systems. Digital trunks can now be supported in any IP Expansion Cabinet or Mini main chassis, when connected via 100BaseT or 100BaseF. A total of 45 digital trunks could be supported on Option 11C, and 15 digital trunks supported on Mini.

The following CE cards can now be supported in IP expansion cabinets/mini main chassis.

- 1.5MB DTI/PRI (NTAK09)
- 1.5MB TMDI (NTRB21)
- 2.0MB DTI (NTAK10)
- 2.0MB PRI (NTAK79)
- 2.0MB PRI (NTBK50)
- MISP (NTBK22)
- SDI DCH (NTAK02) (Only DCH is supported in IP Expansion Cabinets. ESDI AML and TTY are not supported.)

This development also provides increased SDI/D-channel capacity. Three SDI ports are provided with each IP Expansion Cabinet and D-Channel capacity has been increased, such that a total of 16 D-channels are now supported per cabinet.

Option 11C IP Expansion introduces two types of IP daughterboards:

- 100BaseT IP daughterboard
- 100BaseF IP daughterboard.

These boards are available in single and dual port versions. The dual port IP daughterboard connects to the SSC of a Main cabinet and supports connections to two expansion cabinets, each equipped with an SSC, via IP. The single port IP daughterboard is used at the IP Expansion to provide connectivity back to the Main.

The Option 11C SSC card can accommodate up to two single or dual port IP daughterboards. The IP daughterboards can coexist with either the single port or dual port fibre daughterboards.

Survivable IP Expansion Cabinets

IP Expansion Cabinets can be configured to be survivable in the event of a link failure, or a catastrophic failure of the main cabinet.

Based on the system configuration, if IP connectivity to the main is lost or a manual command is issued, an IP expansion cabinet can enter survival mode in which it acts as a fully functional "Stand-alone" Option 11C.

The number of survivable expansion cabinets allowed on a specific system is controlled via a new ISM parameter, "Survivability", which has a range of 0-4. The default value for this ISM parameter is zero.

Voice Distribution over Campus Data Network

The IP Connectivity of expansion cabinets enables a high capacity, cost effective solution to distribute Option 11C and Mini cabinets over a high performance data network.

Full feature functionality, and non blocking architecture is maintained when Option 11C systems are distributed over high performance data networks. This patented solution delivers the exceptional functionality and reliability of Meridian 1 Option 11C, while delivering the benefits of voice/data convergence.

Support of Option 11C Mini Cabinetry

This aspect of Option 11C IP Expansion allows the software functionality described above to be supported on the Option 11C Mini platform as well as the Option 11C platform.

A mix and match strategy allows a mixture of both Option 11C's and Mini chassis within the same system.

Package Requirements

IP Connectivity is packaged under package number 295. If the IP Expansion package is restricted, IP connectivity between the Main and IP Expansions will be disallowed, regardless of whether or not IP daughterboards are connected to the Main. CE-Mux Expansion is not separately packaged, but is dependent on package number 295.

Equipment identification

Contents

This section contains information on the following topics:

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NT5K20 and NT5K48 Tone detector Cards 25

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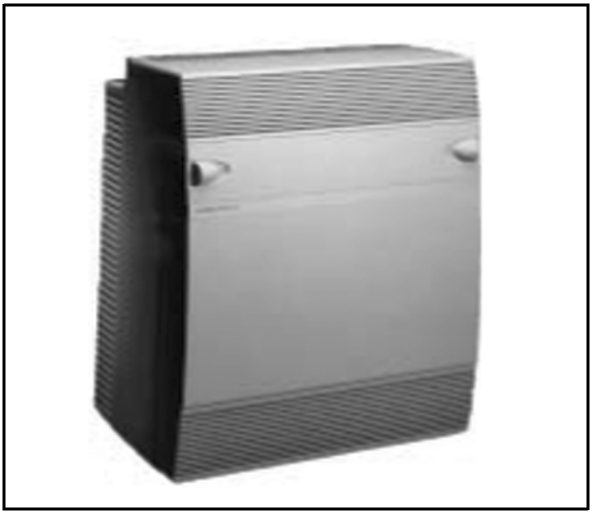
General information

This chapter identifies the major components of the Option 11C that are pertinent to installation. Identification codes are given where appropriate.

Cabinets

The NTAK11 Cabinet is used for both main and expansion cabinets. The cabinet faceplate has been updated for Release 25.2x.

Figure 1
NTAK11 Cabinet

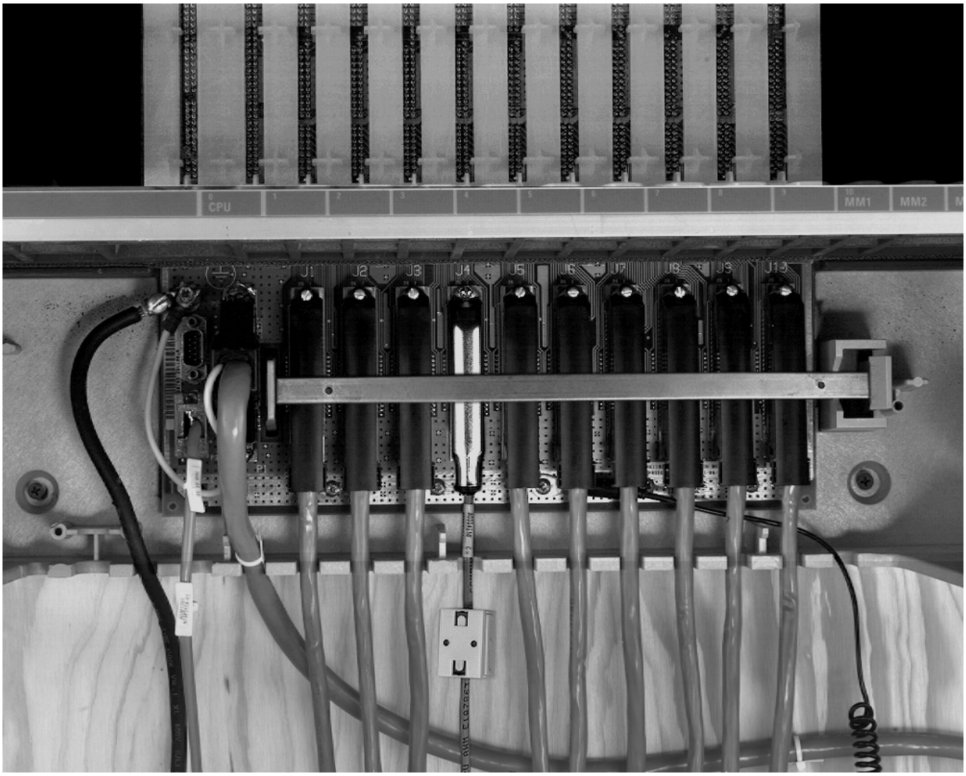


Cable connectors

Connectors for cables to the cross-connect terminal and SDI ports are found at the bottom of each cabinet.

The AUX, SDI and Ethernet connectors are located at the bottom left-hand side of the cabinets. The AUX port connects auxiliary equipment such as a Power fail transfer unit (PFTU) to the Option 11C in each cabinet. The SDI connector in the main and IP expansion cabinets interfaces three SDI ports using a three-port SDI cable. The Ethernet connector in the main cabinet provides a 10 Mbps Ethernet port.

Figure 2
Cable connections


CPU
MM1
MM2
J1
J2
J3
J4
J5
J6
J7
J8
J9
J13

Cooling

The NTAK11 cabinet is designed to permit natural convection cooling.

CAUTION

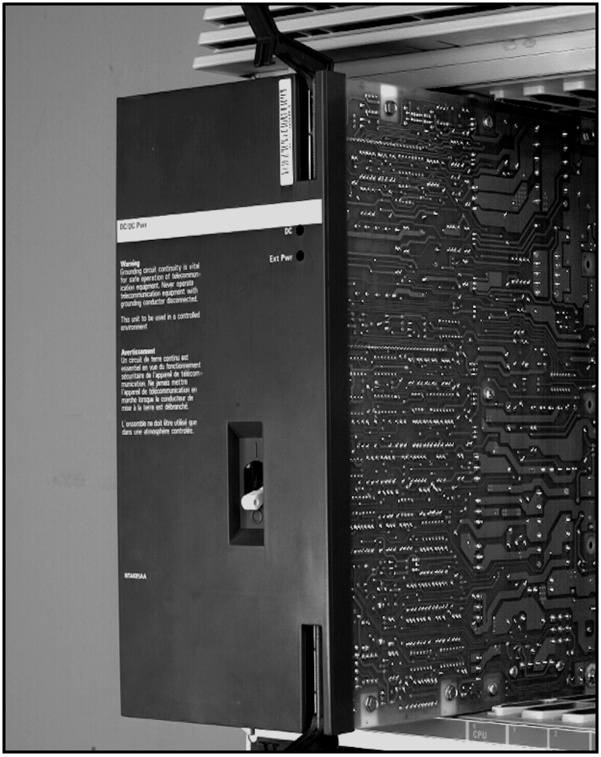
Make sure ventilation to the cabinets is not obstructed.

Power supplies

Two types of power supply are available for the system:

- The NTAK04 or NTDK78 AC/DC power supply (see Figure 3 on page 18).
- The NTAK05 or NTDK72 DC power supply is used when the cabinet is powered by a -52 V dc source.

Figure 3
AC/DC power supply


DC/DC Pwr
DC
Ext Pwr
Warning
Grounding circuit continuity is vital for safe operation of telecommunication equipment. Never operate telecommunication equipment with grounding conductor disconnected.
This unit to be used in a controlled environment
Avertissement
Un circuit de terre continu est essentiel en vue du fonctionnement sécuritaire de l'appareil de télécommunication. Ne jamais mettre l'appareil de télécommunication en marche lorsque le conducteur de mise à la terre est débranché.
L'ensemble ne doit être utilisé que dans une atmosphère contrôlée.
NTAK05AA
CPU

Reserve power

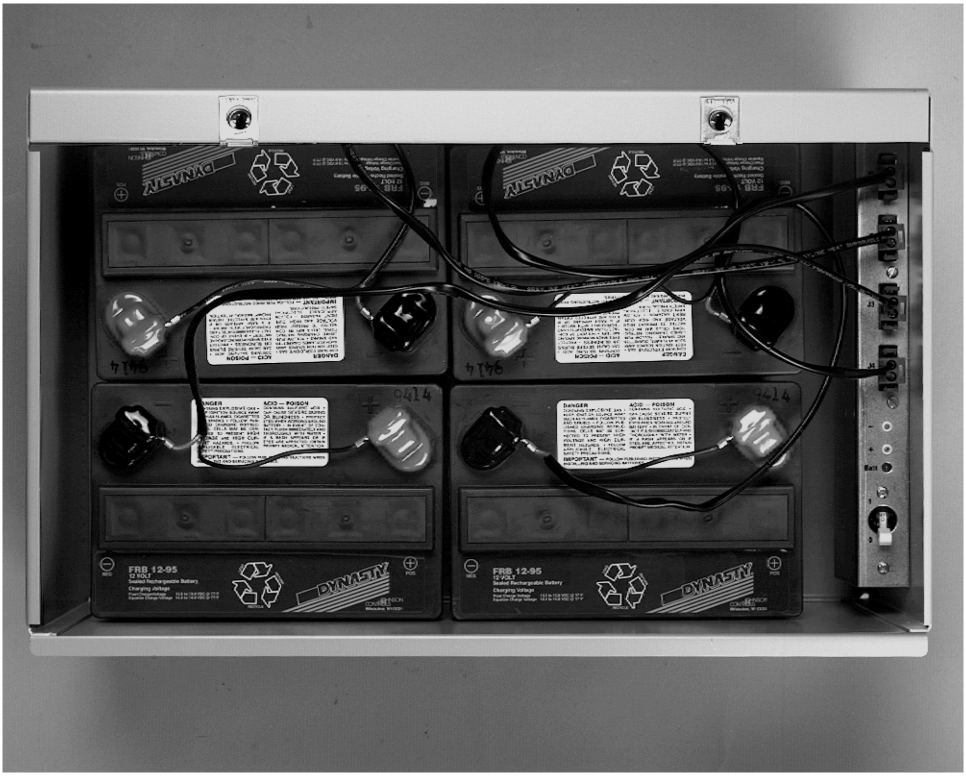
CAUTION

If the NTAK04 or NTDK78 AC/DC power supply is powered down while it is operating on DC reserve power from a battery backup unit, the Option 11C system cannot be powered up again until AC power is restored. Be careful not to open the circuit breaker, either on the battery backup unit, or on the NTAK04 or NTDK78, while the system is operating on battery backup.

Three types of reserve battery power can be used with the Option 11C system:

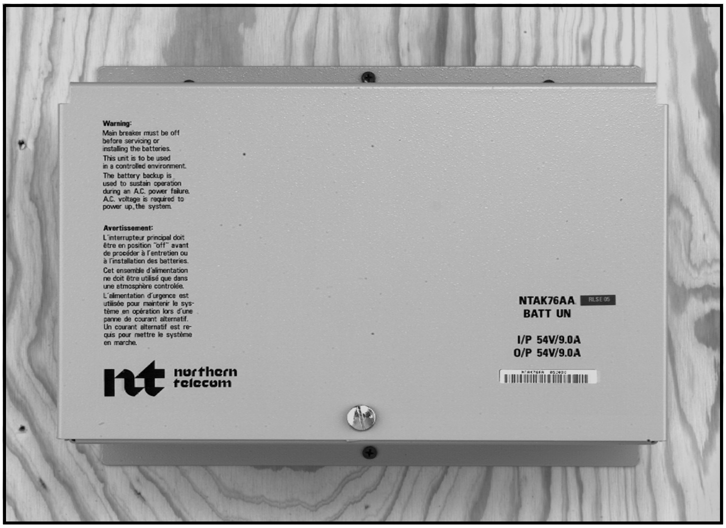
- The NTAK75 battery box (shown in Figure 4 on page 20) provides a minimum of two hours of reserve DC power.

Figure 4
NTAK75 battery box



- The NTAK76 battery box (shown in Figure 5 on page 21) provides a minimum of 15 minutes of reserve DC power.

Figure 5
NTAK76 battery box


Warning:
Main breaker must be off before servicing or installing the batteries.
This unit is to be used in a controlled environment.
The battery backup is used to sustain operation during an A.C. power failure. A.C. voltage is required to power up the system.
Avertissement:
L'interrupteur principal doit être en position "off" avant de procéder à l'entretien ou à l'installation des batteries.
Cet ensemble d'alimentation ne doit être utilisé que dans une atmosphère controlée.
L'alimentation d'urgence est utilisée pour maintenir le système en opération lors d'une panne de courant alternatif. Un courant alternatif est requis pour mettre le système en marche.
northern telecom
NTAK76AA
BATT UN
I/P 54V/9.0A
O/P 54V/9.0A

- An UnInterruptible Power supply (UPS) for continuous AC power supply.

  Note: Customer-supplied battery backup units can be connected to the cabinets using an NTAK28 Junction Box.

Common equipment circuit cards

The circuit cards described in this section are used in the Option 11C Main cabinet and IP Expansion cabinets where indicated.

Small System Controller (SSC) card and components

The NTDK20EA SSC card is the minimum vintage required for Option 11C main cabinets with IP connectivity.

> ***Note:*** The NTDK20CA and the NTDK20DA earlier vintages may be used in IP Expansion cabinets only.

Software Daughterboards

The latest version of the Software Daughterboard is:

- The NTTK25AA, which provides 48 Mb of memory.

IP Daughterboards

For IP connectivity, four new IP daughterboards are available:

- The NTDK83 dual port 100BaseT
- The NTTK02 dual port 100BaseF
- The NTDK99 single port 100BaseT
- The NTTK01 single port 100BaseF

Figure 6
The NTDK83 IP Daughterboard

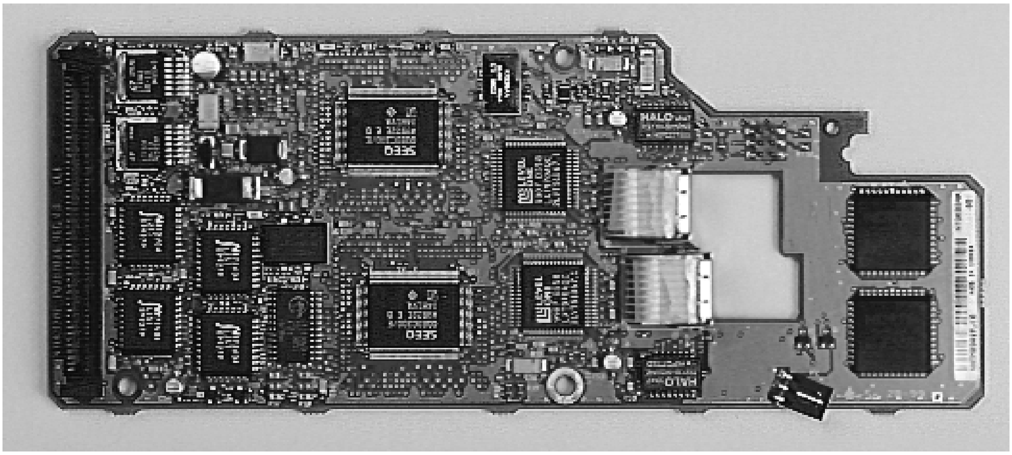


Figure 7
The NTTK02 IP Daughterboard

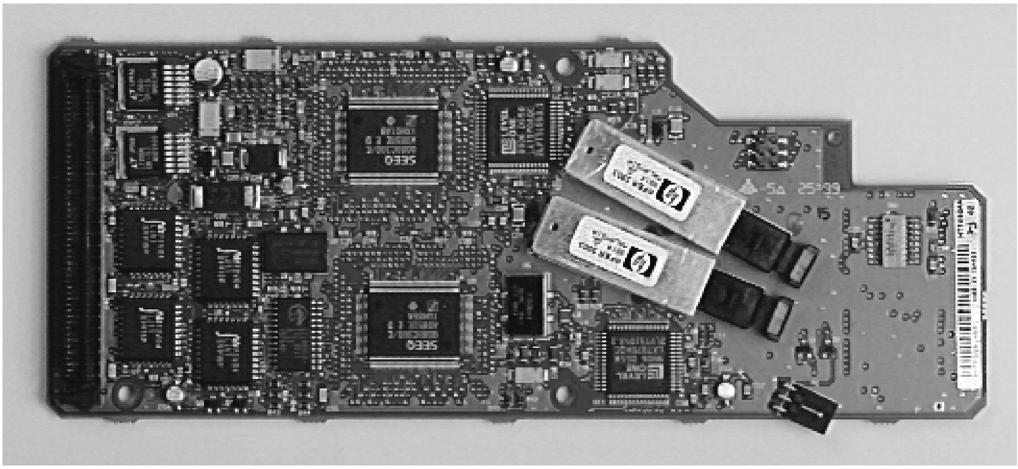


Figure 8
The NTDK99 Daughterboard

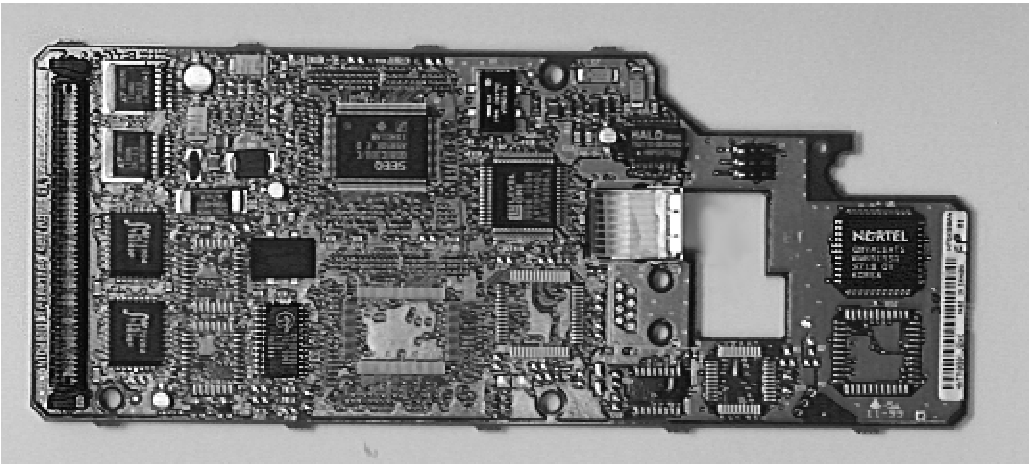
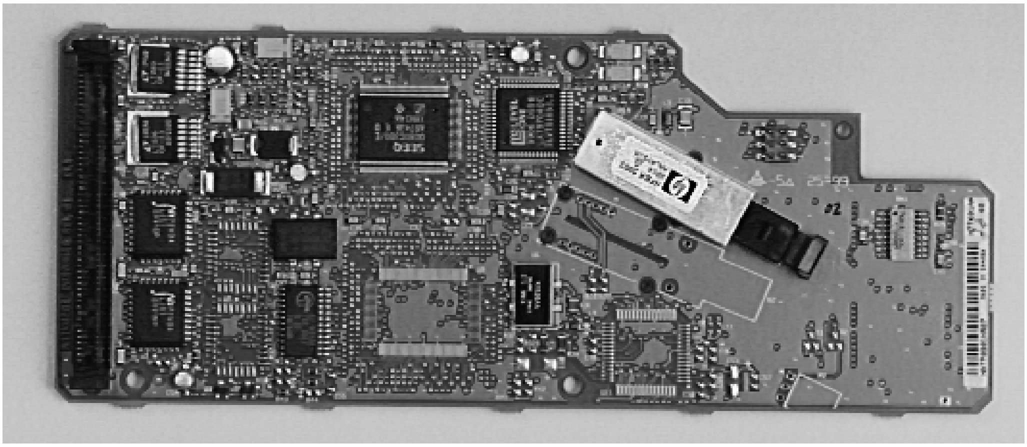


Figure 9
The NTTK01 Daughterboard



Fiber Daughterboards

There are five types of Fiber Expansion Daughterboards; three single port and two dual port:

- The NTDK22 Single Port Fiber
- The NTDK24 Single Port Fiber
- The NTDK79 Single Port Fiber
- The NTDK84 Dual Port Fiber
- The NTDK85 Dual Port Fiber

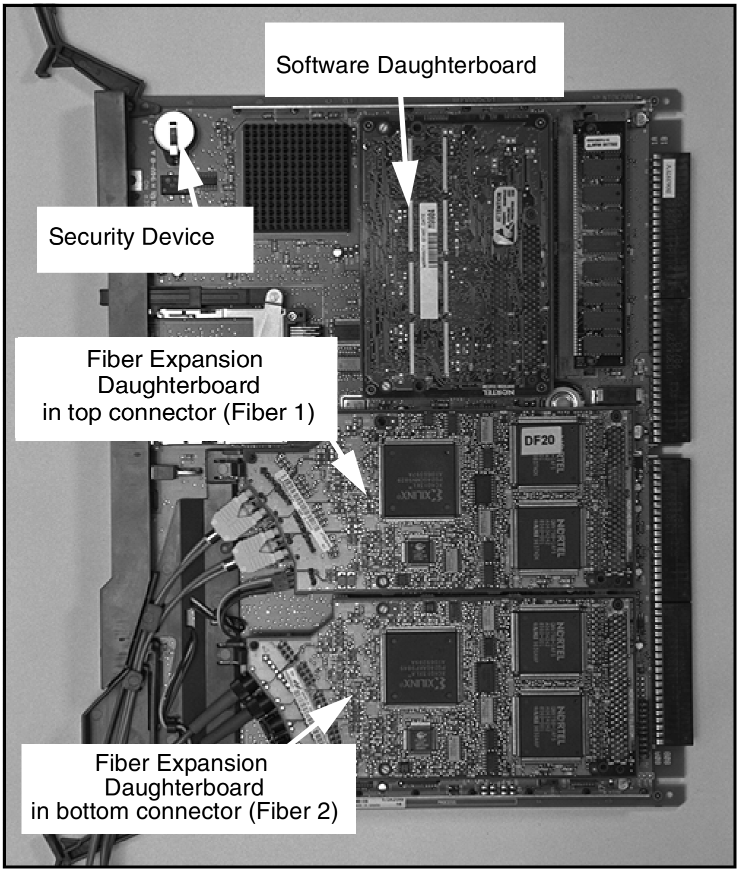
Security Device

A Security Device is required on the NDK20EA SSC card of the main and all IP expansion cabinets. There are two types of security devices:

- The NT_STD required in the main cabinet
- The NT_REM required in the IP expansion cabinets

Both devices look identical, but can easily be identified by the label.

Figure 10
Daughterboards and Security Device on the NTDK20 SSC card


Software Daughterboard
Security Device
Fiber Expansion Daughterboard in top connector (Fiber 1)
Fiber Expansion Daughterboard in bottom connector (Fiber 2)

NTAK02 SDI/DCH card

This optional SDI/DCH card provides four SDI ports for various applications.

NTAK03 TDS/DTR card

Provides tone transmission and detection plus two SDI ports.

NT5K20 and NT5K48 Tone detector Cards

Provide DTMF or DT detection.

ISDN and Digital Trunk Interface

Table 1
Common equipment packs and daughterboards supported in Option 11C IP cabinets

Pack	Daughterboard	Supported Application
1.5MB DTI/PRI (NTAK09)	DCHI (NTAK93) DDCH (NTBK51) CC (NTAK20)	non-downloadable downloadable DCH Clock controller (stratum 3/4)
1.5MB TMDI (NTRB21)	CC (NTAK20)	downloadable DCH clock controller (stratum 3/4)
2.0MB DTI (NTAK20)	n/a	clock controller (stratum 3/4)
2.0MB PRI (NTAK10)	n/a	clock controller (stratum 3/4) DCH
2.0MB PRI (NTBK50)	DDCH (NTBK51) CC (NTAK20)	downloadable DCH clock controller (Stratum 3/4)
MISP (NTBK22)	CC (NTAK20)	MISP BRI processor clock controller (stratum 3/4)
SDI_DCH (NTAK02)	n/a	only DCH is supported ESDI, AML, TTY are not supported
Card Option Mail is not supported	n/a	n/a

Fiber Expansion Equipment

Fiber Receiver card

There are three versions of the Fiber Receiver card. Each has a corresponding Fiber Expansion Daughterboard:

- the NTDK23 (10m),
- the NTDK25 (3km, multimode)
- NTDK80(3km, singlemode).

Fiber Expansion Daughterboard

Single Port Fiber Expansion Daughterboard

The Single Port Fiber Expansion Daughterboards and their Fiber Receiver counterparts are:

- The NTDK22 Fiber Expansion Daughterboard. Its Fiber Receiver card counterpart is the NTDK23.
- The NTDK24 daughterboard. Its Fiber Receiver card counterpart is the NTDK25.
- The NTDK79 daughterboard. Its Fiber Receiver card counterpart is the NTDK80.

Figure 11
The NTDK22 Daughterboard

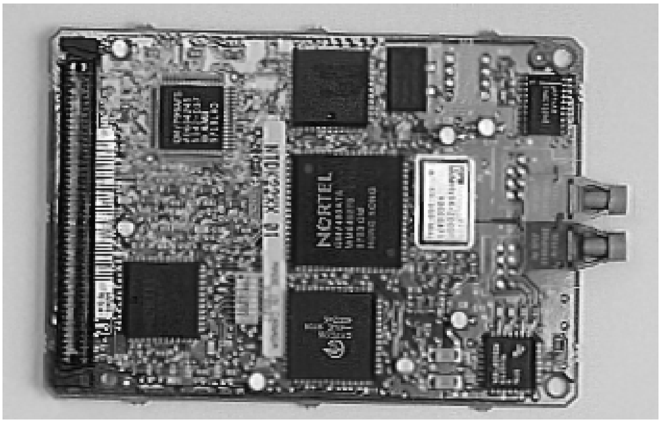
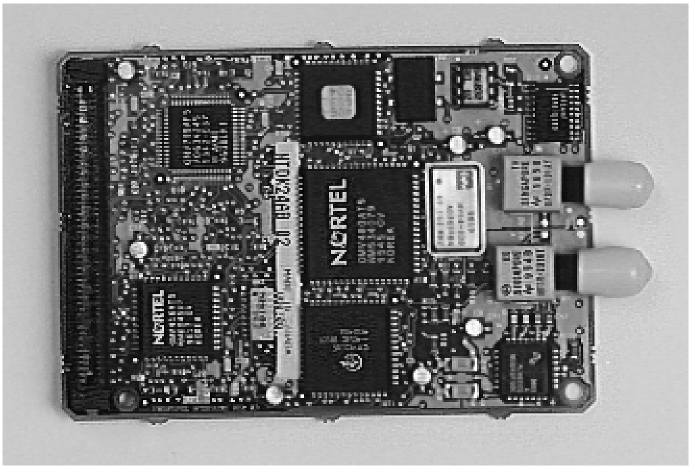


Figure 12
The NTDK24 Daughterboard



Dual Port Fiber Expansion Daughterboard

The Dual Port Fiber Expansion Daughterboards and their Fiber Receiver counterparts are:

- The NTDK84 Dual Port Fiber Expansion Daughterboard. Its Fiber Receiver card counterpart is the NTDK23.
- The NTDK85 daughterboard. Its Fiber Receiver card counterpart is the NTDK25.

Figure 13
The NTDK84 Daughterboard

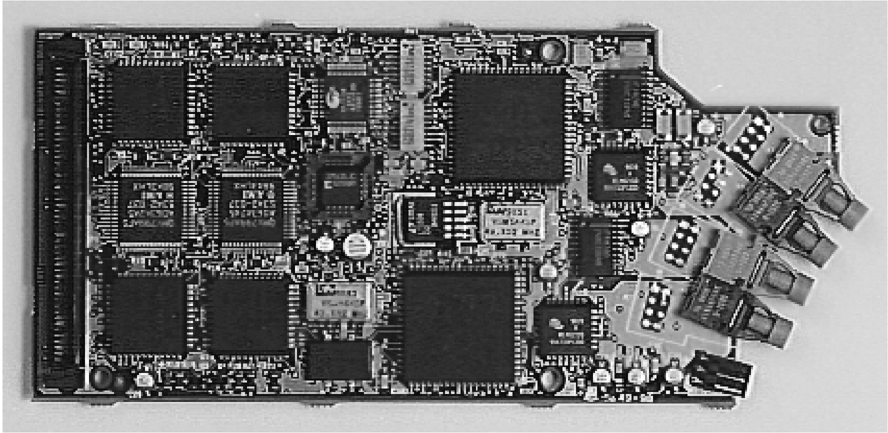
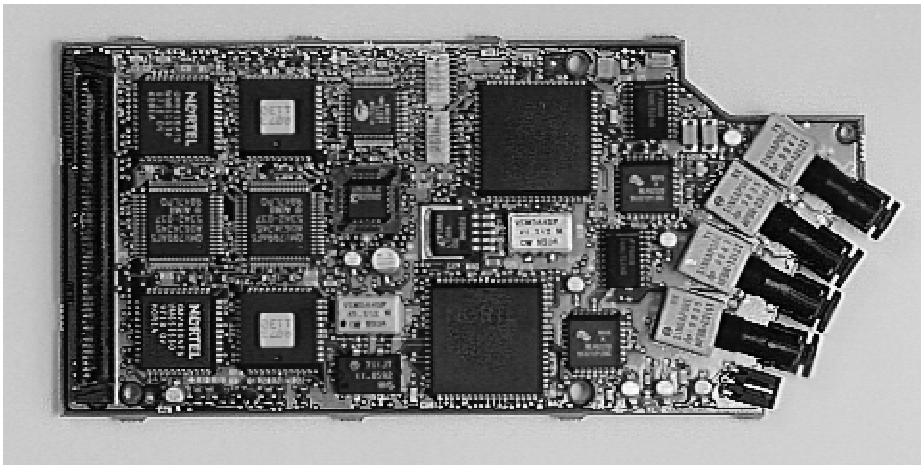


Figure 14
The NTDK85 Daughterboard



Peripheral equipment cards

The following Intelligent Peripheral Equipment (IPE) cards can be used in the Option 11C Main and IP Expansion cabinets:

- NT1R20 Off-Premise Station (OPS) Analog line card
- NT8D02 Digital line card
- NT8D03 Analog line card
- NT8DO9 Analog message waiting line card
- NT8D14 Universal Trunk card
- NT8D16 Digitone Receiver card.
- NT8D15 E&M Trunk card
- NT5K02 (International) Analog line card
- NT5K18 (International) 8 Port COT/PPM Trunk card
- NT5K17 (International) 8 Port DID Trunk card
- NT5K19 (International) 4 Port 2W/4W E&M, RAN, Paging AC15 trunk card
- NT5K21 (International) Multi Frequency Compelled Sender/Receiver card
- NT5K36 (International) 4 Port German DID/DOD Trunk card
- NT7D16 Data Access card (DAC)
- NTAG26 Extended Multi-frequency Receiver (XMFR) card

Telephones and attendant console

The following is a list of the telephones supported by Option 11C:

- Analog (500/2500 type) Telephones with or without message waiting lamps
- Meridian Digital Telephones (M2006, M2008, M2009, M2018, M2112, M2216, M2616 and M3000)

- M2616 or M2216 Central Answering Position (CAP). This telephone must be equipped with an ACD LCD display in order to function as a CAP telephone.
- Meridian 2250 (TCM) attendant consoles.

Cables and wires

Table 2
Cable and wire specifications (Part 1 of 3)

Cables and wires	Purpose/description
A0317094 power cord	Connects a system cabinet to a 110 V ac commercial power source Length: 9 ft 10 in. (3000 mm).
A0391685 power cord	Connects a system cabinet to a 220 V ac commercial power source Length: 9 ft 10 in. (3000 mm).
NTDK27 Ethernet adaptor cable	Provides a 15-pin AUI ethernet interface.
A0632902 Fiber Optic cable (multi-mode plastic)	Connects a Main and Expansion cabinet by interfacing with an expansion daughterboard and a Fiber Receiver card. Length: 10 m (33 ft)
Glass Fiber Optic cable (3 km) used on fibre expansion daughterboards (multimode or single mode, depending on interface)	Must be supplied locally by a facilities provider. Length up to 3 km (1.8 mi)
Glass Fibre Optic Cable used on 100BaseF expansion daughterboards (Multimode only) up to 2 km	Must be supplied locally by a facilities provider. Length up to 2 km
NTTK34AA cable	100BaseT connection between the Main and IP Expansion cabinets in a pt. to pt. configuration.
NTDK8305 cable	100BaseT connection between the Main and IP Expansion cabinets in a pt. to pt. or LAN configuration.

Table 2
Cable and wire specifications (Part 2 of 3)

Cables and wires	Purpose/description
A0817052 MT-RJ to ST cable (5 m)	Connection between the Main and IP Expansion cabinets using 100BaseF IP daughterboards.
AO817055 MTRJ to MTRJ (10m)	100BaseF connection between main and expansion cabinets.
A0346816 ST Fibre Coupler	Allows two 100BaseF MTRJ to ST cables to connect to one another in a point-to-point configuration.
NTAK0420 power cable	Connects a system cabinet to a reserve battery power supply, or to a DC power source in conjunction with an NTAK28 Junction box.
NTAK1104 AUX cable	Connects a PFTU to a system cabinet, and provides power to an M2250 attendant console.
NTBK48 three-port SDI cable	Connects TTYs, modems, and so on, to Option 11C. It is used in conjunction with the NDK20EA card.
NTAK1118 one-port SDI cable	Connects TTYs, modems, and so on, to Fiber Receiver card supported SDI ports in the expansion cabinets. The cable provides a 9-pin to 25-pin converter connection.
NTAK19EC cable	Two-port SDI cable used with the NTAK03 circuit card.
NTAK19FB cable	Four-port SDI cable used with the NTAK02 circuit card.
A0601397 F-F DCE to DTE converter, or A0601396 F-M DCE to DTE converter	May be required when connecting SDI ports to TTYs, modems, etc.
NTBK04 1.5 Mb DTI/PRI carrier cable (A0394216)	Connects the NTAK09 1.5 Mb DTI/PRI card to the Channel Service Unit (CSU). Brings Tx and Rx pairs to a standard 5 pin connector.

Table 2
Cable and wire specifications (Part 3 of 3)

Cables and wires	Purpose/description
NTBK05CA coax cable NTBK05DA twisted pair cable NTAK10 2.0 Mb DTI cable NTAK79 2.0 Mb PRI cable NTAK50 2.0 Mb PRI cable	Provides DTI/PRI connections. Brings Tx and Rx pairs to a standard 5 pin connector.
NE-A25B 25-pair cable	Connects peripheral equipment cards to cross-connection terminals. NE-A25B connector slots are located on the bottom of each cabinet.
#6 AWG (#40 Metric Wire Gauge) insulated ground wire	Connects a system cabinet to a building ground source.
Cross-connecting wire	Makes cross-connections at the cross-connect terminal.

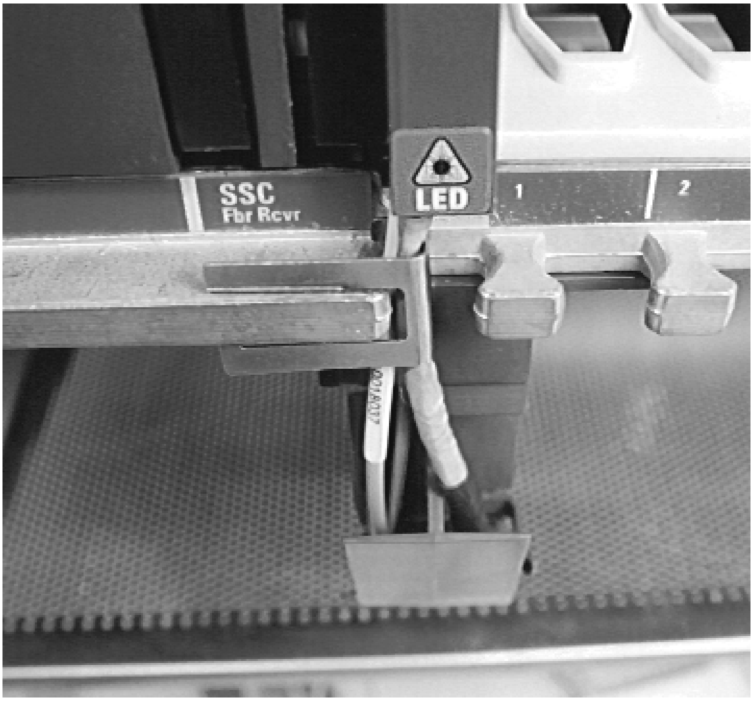
Miscellaneous items

The following is a list of typical miscellaneous items that can be used as part of the system installation. Quantities needed depend on the site and customer requirements:

- QUA6 Power fail transfer units (PFTU) to transfer lines during a power or system failure
- modems or Data Communication Equipment (DCE) for remote access to the system
- on-site Data Terminating Equipment (DTE) or teletypewriter (TTY) terminal for accessing the system
- connecting blocks for the cross-connect terminal
- transformers and centralized power supplies for items such as digit displays on telephones
- optional equipment such as music sources, RAN machines, paging equipment and CDR devices
- NTAK92 Off-Premise Protection module for connecting up to four off-premise analog telephones

- additional Modem Eliminator (NULL Modem without hardware handshaking) A0601397 converter may be required to interface the DTE to the system.
- EMC Grounding Clip is required, for EMC compliance, on the front stiffener rail of the IP cabinet. Refer to Figure 15 on page 34 for further details.

Figure 15
EMC Grounding Clip



System and site requirements

Contents

This section contains information on the following topics:

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Reference list

The following are the references in this section:

- *Option 11C Customer Controlled Backup and Restore (CCBR)* (553-3011-330)
- *Option 11C and 11C Mini Technical Reference Guide* (553-3011-100)

General information

Before installing the Option 11C system, take some time to plan the installation to ensure the system performs correctly.

Make sure that the site meets all of the following environmental, grounding, power, and cross-connect terminal requirements before proceeding with the installation.

Environmental requirements

The Meridian 1 Option 11C system is designed to operate in an office environment that meets the following general conditions:

- The room is clean and well ventilated. Each cabinet can dissipate up to 500 Watts of power in the form of heat (1700 BTU [1800 kJ] per hour). Equipment room ventilation must be sufficient to maintain the temperature at an acceptable level.
- The temperature is maintained between:
  - 0° and 45° C (32° and 113° F) when the cabinets are mounted side-by-side.
  - 0° and 35° C (32° and 95° F) when the cabinets are mounted one above the other.

- The humidity is maintained between 5% and 95% non-condensing.
- The location selected to mount the equipment is not subject to constant vibration.
- The equipment is located at least 12 ft (3660 mm) away from sources of electrostatic, electromagnetic or radio frequency interference. These sources may include:
  - power tools
  - appliances (such as vacuum cleaners)
  - office business machines (such as copying machines)
  - all electric motors
  - electrical transformers.

Earthquake bracing requirements

IMPORTANT

The following earthquake bracing guidelines conform to the requirements for the state of California specifications in the U.S.A.

The guidelines recommend that the installer mount the cabinets on a wall using a sheet of 3/4 in. (20 mm) plywood as a backboard. The plywood should be secured to the wall with a minimum of six fasteners. (Refer to Table 4 on page 38 for a description of appropriate fasteners.)

Table 3 identifies the maximum allowable wall height in earthquake prone areas for various types of stud wall construction.

Table 3
Minimum wall requirements – stud construction

Wall Studs	Spacing off center	Maximum Height of Wall
2 in. x 4 in. wooden studs	16 in. or 24 in.	10 ft
2 in. x 6 in. wooden studs	16 in. or 24 in.	16 ft
3 5/8 in. 20 gauge metal studs	16 in. or 24 in.	12 ft
3 5/8 in. 18 gauge metal studs	16 in. or 24 in.	16 ft

Table 4
Minimum fastener requirements

Type of wall	Fasteners	
Wooden studs	#10 wood screws	Minimum 1 in. embedment in wood studs
Metal studs	# 14 sheet metal screws	Minimum 1 in. embedment in metal studs
Concrete (2000 PSI)	1/4 in. HILTI KB-II	Minimum 1 1/8 in. embedment
Masonry	1/4 in. Ramset Redhead Dynabolt sleeve anchor	

The mounting bracket for each cabinet should be fastened to the sheet of plywood with the five, 1 in. #14 screws supplied with the bracket.

A detailed procedure for earthquake bracing is included in "Bracing cabinets against earthquakes" on page 91 of this handbook.

Grounding requirements

WARNING

Failure to follow grounding recommendations may result in an installation that is:

- unsafe for personnel working on, or using the equipment
- not properly protected from lightning or power transients
- subject to service interruptions

Grounding requirements

Before installing an Option 11C and applying AC power, measure the impedance of the building ground reference. (An ECOS 1023 POW-R-MATE or similar meter is suitable for this purpose.) If the ground path connected to the Option 11C has an impedance of 5 Ohms or more, better grounding arrangements should be made. Any improvements to the grounding system should be made before the Option 11C is installed.

Other grounding requirements are as follows:

- The impedance of the link between the ground post of the system cabinets and the Single Point Ground (SPG) to which it is connected must be less than 0.25 Ohms.
- Never connect the single point ground conductor from the Option 11C system to structural steel members or electrical conduit. In particular, never tie this conductor to a ground source or grounded electrode that is not hard-wired to the building reference conductor.
- Ground conductors for the Option 11C system:
  - must not be smaller than #6 AWG (#40 metric) at any point
  - must be routed through the same conduit as the phase conductors serving the system
  - must not be smaller than any phase conductor in the same conduit
  - do not carry current under normal operating circumstances.

- All ground conductors in the building:
  - must be isolated from the neutral bus except at the service entrance to the building
  - must be hardwired to the main ground reference.
- Avoid spliced conductors. Continuous conductors have lower impedance and are more reliable than spliced ones.
- All conductors must be terminated in a permanent manner. Ensure all terminations are easily visible and accessible for maintenance purposes.
- Tag ground connections clearly with a message such as “CRITICAL CONNECTION: DO NOT REMOVE OR DISCONNECT”.

CAUTION

Once the Option 11C is installed, the impedance of the link between the ground post of the main cabinet and the single point ground to which it is connected must be less than 0.25 Ohms.

CAUTION

Reliable Option 11C operation depends on high-precision internal circuitry, which can be damaged by transients in its supply conductors and ground system. Damage to sensitive devices due to transients may not be immediately apparent: degradation may occur over longer periods of time.

Ground bus isolation

It is permitted in the USA under the exception to article 384-20 in the NEC to isolate a panel's ground bus from the housing, provided the panel concerned is not at the main service entrance. This is also permitted in some Canadian locations. For more information on ground bus isolation, refer to local electrical codes.

CAUTION

Do not isolate the ground bus from the housing unless it is specifically permitted by local electrical codes. Work inside electrical panels should only be performed by qualified electricians. Do not attempt to remove bonding conductors without approval from qualified personnel.

CAUTION

Ground conductors between supply panels must be routed through the same conduit as the supply conductors. This is a safety requirement of both the NEC and CEC.

Grounding method

CAUTION

In order to prevent ground loops, it is recommended that cabinets be powered from the same dedicated power panel, and that all cabinets are grounded to the power panel through the grounding bar.

The method of grounding used for the Option 11C depends on whether all cabinets are powered by the same service panel.

Three grounding scenarios are possible:

- A single-cabinet system
- A two- to five-cabinet system powered by the same service panel
- A two- to five-cabinet system powered by different service panels.

Single-cabinet system or cabinets powered by one service panel

For each system cabinet, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to the NTBK80 ground bar provided. The ground bar, in turn, is connected to a ground source (the ground bus in the AC power service panel) and the expansion cabinets.

Cabinets powered by different service panels

For each system cabinet, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to the NTBK80 ground bar provided. If any cabinet cannot be powered from the same service panel, then it must be grounded separate from the others back to the service panel that supplies it.

> ***Note:*** A separately grounded cabinet is grounded the same as a single-cabinet system.

Conduit requirements

Conductive conduit linking panels and equipment are legal for use as a grounding network in most countries. It is recommended that properly sized, insulated copper conductors routed inside conduit for all Option 11C system ground paths be used whenever possible. A ground link dependent on conduit may compromise or defeat the improvements made by installing dedicated panels and transformers. Here are the reasons why:

- Conduit links may be separated by personnel servicing unrelated equipment. If such a separation occurs anywhere between the Option 11C system and the building ground reference, the conduit is incapable of providing a ground path. This is a hazardous situation.

- Metallic conduit is liable to corrode over time, particularly at threaded connections. Such corrosion will increase resistance significantly. This problem is compounded when multiple links are involved. Application(s) of paint over the conduit may accelerate the corrosion process.
- Conduit is required to be anchored to secure surfaces. Often, it is bolted to structural steel members, which may function as ground conductors to very noisy equipment, such as compressors, motors, and so on. The coupling of these noisy signals into the Option 11C grounding system may seriously impair its performance. The resulting intermittent malfunctions can be difficult to trace.

Commercial power requirements

The Option 11C system is available in both AC-powered and DC-powered versions.

AC-powered version

The AC-powered version is presented in two separate sections in this Chapter:

- Optimal AC-powered installation
- Alternative AC-powered installation

The optimal installation of an AC-powered Option 11C system consists of a direct connection to the electrical system in the building, provided certain requirements are met. Refer to AC-powered installation later in this chapter for detailed information.

Alternatively, an approved isolation transformer may be used for AC-powered systems, where meeting the optimum requirements may be too expensive or may not be achievable. See “Alternative AC-powered installation” on page 45.

DC-powered version

With the DC-powered version of Option 11C, each cabinet is powered solely from a DC power source. See DC-powered version later in this chapter for detailed information.

AC-powered installation

It is recommended that a dedicated AC service panel be used with the Option 11C system. Equipment unrelated to the Option 11C must not be connected to this panel. Keep all lighting, fans, motors, air conditioning equipment, and the like, as "electrically separate" from the Option 11C system as possible.

Power from each outlet must meet the input requirements of at least one Option 11C power supply as itemized in Table 5 on page 44. Please check power requirements for other system equipment and install additional outlets if required.

Table 5
AC input requirements for each NTAK04 or NTDK78 power supply

Voltage	Maximum rated input voltage 100-240 Volts RMS, single phase, 50-60 Hz.
Power (I/P max)	750 VA minimum
Outlet Type	NEMA IG5-15R for 120 Volt, 15 Amp supply NEMA IG6-15R for 208/240 Volt, 15 Amp supply

Site requirements

The following is a list of required site features for an optimal Option 11C AC-powered system installation.

If the conditions below cannot be provided with a dedicated panel, the use of an Isolation Transformer is recommended, as described under the heading "Alternative AC-powered installation" on page 45 of this chapter.

- **Dedicated circuit breaker panel**

  Provides power solely to the Option 11C system and its associated hardware, such as TTYs, printers, and so on.

  Note: It may not always be possible to power a complete system from a single circuit-breaker panel. For example, an expansion cabinet may be remotely located.

- **Insulated copper ground conductor**

  Connects the ground bus in the dedicated panel to the main service panel ground or building ground reference. It must always be routed through the same conduit as the supply conductors feeding the panel.

- **Isolated-ground receptacles**

  All outlets connected to the dedicated panel must be of the isolated ground type. A separate circuit is to be used for each device connected to the panel. Outlets serving the cabinets must be close enough so that the power cord can reach the cabinet power supply.

  For systems equipped with one or two expansion cabinets, a separate outlet for each cabinet must be provided. Each outlet must be from separate circuits in the same panel.

- **Isolated ground bus in the electrical panel, where permitted by local codes.**

Location of power outlets

The maximum distance between a power outlet and the system cabinet depends on the length of the power cord. In North America, the power cord is 9 ft 10 in. (3000 mm) long. In countries outside North America, the power cord is 8 ft 2 in. (2490 mm) long.

Alternative AC-powered installation

If optimal conditions cannot be provided with a dedicated panel, the use of an Isolation Transformer with the following characteristics is recommended:

- 120/208/240 V input, over-current protected at primary
- 120/208/240 V available at secondary outputs, each circuit breaker-protected
- Primary and secondary windings must be fully isolated from one another
- Certified for use locally as a stand alone user product (CSA, UL, or other locally recognized markings apparent)
- Capable of providing power to all Option 11C system equipment operating simultaneously at full load
- Equipment unrelated to the Option 11C system must not be powered from a transformer serving the Option 11C system.

Isolation transformer ground

It is recommended that the transformer ground have the following characteristics:

- Separate grounds for primary and secondary windings rather than common ground
- A “clean” and permanent SPG reference at the transformer secondary for the Option 11C system.

In addition, verify the ground conductors inside the transformer to ensure they are sized appropriately.

> ***Note:*** Do not ground the transformer or Option 11C system to structural steel or water pipes. Connect them to a known building ground reference.

Receptacles

Receptacle requirements are as follows:

- When mounted on the wall, they must be installed within reach of the cabinet power cords
- All receptacles served by the secondary must be of the isolated ground type
- The ground prong of each outlet must be connected by an insulated conductor to the system SPG.

If the transformer has an isolated secondary ground lug, use it as the SPG. If it doesn’t, use the chassis ground of the transformer as the Single Point Ground.

Installing an Isolation Transformer

Transformers with pluggable power cords:

1 Connect the power cords of all Option 11C system equipment to the outlets on the transformer secondary.

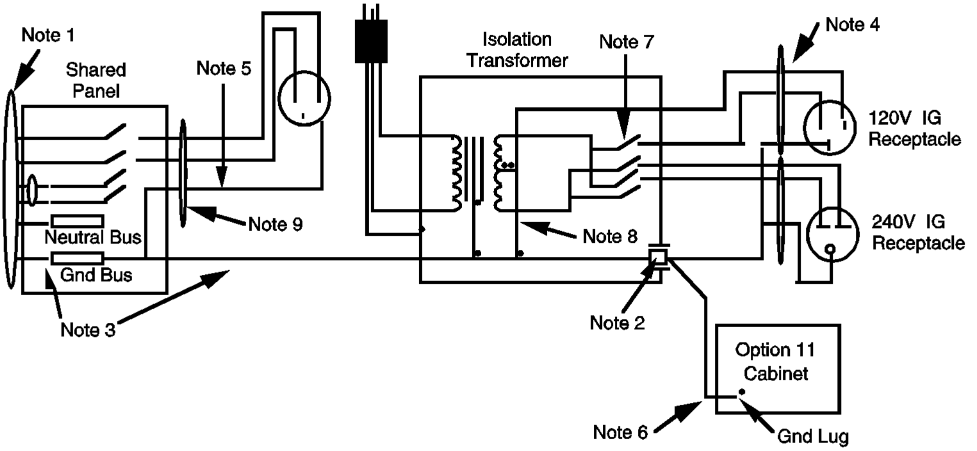
2 Secure an insulated conductor between the ground lug on the main cabinet of the Option 11C and the SPG lug on the transformer. Place a "DO NOT DISCONNECT" tag on it.

Do not fasten or tie this conductor to the power cable feeding the NTAK04 or NTDK78 power supply.

Note: All equipment associated with the Option 11C must be powered exclusively from the secondary of the transformer, and must be grounded to the secondary isolated ground lug. Do not connect unrelated equipment to the Option 11C system isolation transformer.

The transformer primary must be powered through a dedicated circuit. If the primary has a pluggable cord, ensure an additional ground connection is made between the Option 11C SPG and a known building ground reference. This connection is vital for safe and reliable operation. Do not connect any Option 11C system ground lines to structural steel or water pipes, or any other unreliable ground path. Use a ground point known to be "clean" and permanent. Place a "DO NOT DISCONNECT" tag on it. Figure 16 on page 48 shows the pluggable cord connections.

Figure 16
Typical pluggable cord isolation transformer wiring plan


Note 1
Shared Panel
Note 5
Isolation Transformer
Note 7
Note 4
120V IG Receptacle
240V IG Receptacle
Note 9
Neutral Bus
Gnd Bus
Note 8
Note 3
Note 2
Option 11 Cabinet
Note 6
Gnd Lug

Notes:

1 Power source is site dependent. It may be from a shared panel or transformer. Wiring may vary accordingly. Wiring to panel must be housed in conduit.

2 Make SPG at the transformer secondary. If the transformer secondary has no isolated secondary ground lug, make SPG by tieing all system ground lines to the chassis lug on the transformer case. An insulated ground connection must be made between the SPG and a known building ground reference, as per Note 3.

3 Terminate the option 11 SPG insulated ground conductor as near as possible to the main building ground reference. Isolate the ground bus from panel housing if permitted by local codes. Conductor should be minimum AWG #6 (metric #40) at all points.

4 Wiring to receptacles must be in conduit unless they are mounted on the transformer case.

5 Connection may be made by metallic conduit. Additional copper conductor recommended.

6 Minimum AWG #6 (metric #40) insulated copper conductor connected to FGND lug on the Option 11 cabinet. Route separately from AC power cable.

7 Separate breaker required for each Option 11 cabinet. Breakers must be mounted on transformer if the receptacles are. If they are in a panel served by the transformer secondary, all connections between the receptacles and transformer must be in conduit.

8 Connect secondary neutral (X0) to system SPG.

9 Conduit required.

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Transformers without pluggable power cords

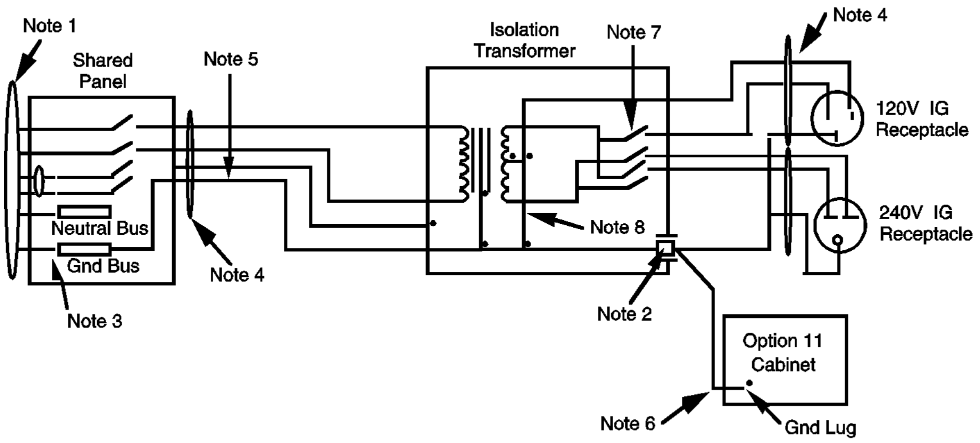
If the transformer does not have a pluggable cord, it must be hardwired to an electrical panel, and all wires (including grounds) must be routed through a single conduit.

Some electrical codes permit the use of conduit as the sole ground conductor between pieces of equipment.

It is recommended that you run a separate insulated ground conductor through the conduit to bond chassis grounds together. Such a conductor will maintain the safety ground connection in the event that the conduit becomes corroded or disconnected.

All ground lines must be run through the same conduit as the phase conductors serving the equipment. Figure 17 on page 50 shows the Isolation transformer connections.

Figure 17
Typical hardwired isolation transformer wiring plan


Note 1
Shared Panel
Note 5
Isolation Transformer
Note 7
Note 4
120V IG Receptacle
240V IG Receptacle
Neutral Bus
Gnd Bus
Note 4
Note 8
Note 3
Note 2
Option 11 Cabinet
Note 6
Gnd Lug

Notes:

1 Power source is site dependent. It may be from a shared panel or transformer. Wiring may vary accordingly. Wiring to panel must be housed in conduit.

2 Make SPG at the transformer secondary. If the transformer secondary has no isolated secondary ground lug, make SPG by tieing all system ground lines to the chassis lug on the transformer case. An insulated ground connection must be made between the SPG and a known building ground reference, as per Note 3.

3 Terminate the option 11 SPG insulated ground conductor as near as possible to the main building ground reference. Isolate the ground bus from panel housing if permitted by local codes. Conductor should be minimum AWG #6 (metric #40) at all points.

4 Transformer primary wires must be in conduit. Wiring to receptacles must be in conduit unless they are mounted on the transformer case.

5 Connection may be made by metallic conduit. Additional copper conductor recommended.

6 Minimum AWG #6 (metric #40) insulated copper conductor connected to FGND lug on the Option 11 cabinet. Route separately from AC power cable.

7 Separate breaker required for each Option 11 cabinet. Breakers must be mounted on transformer if the receptacles are. If they are in a panel served by the transformer secondary, all connections between the receptacles and transformer must be in conduit.

8 Connect secondary neutral (X0) to system SPG.

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DC-powered version

Each Option 11C cabinet may be powered solely from a DC source if it is equipped with the following:

- NTAK05 or NTDK72 DC power supply
- NTAK28 Junction box.

Table 6
DC power requirements for each NTAK05 or NTDK72 DC power supply

	Minimum	Nominal	Maximum
Input Range	-44 V dc	-52 V dc	-54 V dc
Noise (CMESS)	—	—	25 dBrnc
Current	—	—	12 Amps
AC Ripple	—	—	100 mv RMS

Note: The NTAK05 or NTDK72 has a built-in circuit breaker that will trip if the voltage difference at its input terminals drops below -42.5 V dc +/- 1.0 V dc.

CAUTION

Do not allow the voltage difference between the input terminals of the NTAK05 or NTDK72 to exceed 57 V dc. Doing so may result in damage to the equipment and a safety hazard to personnel.

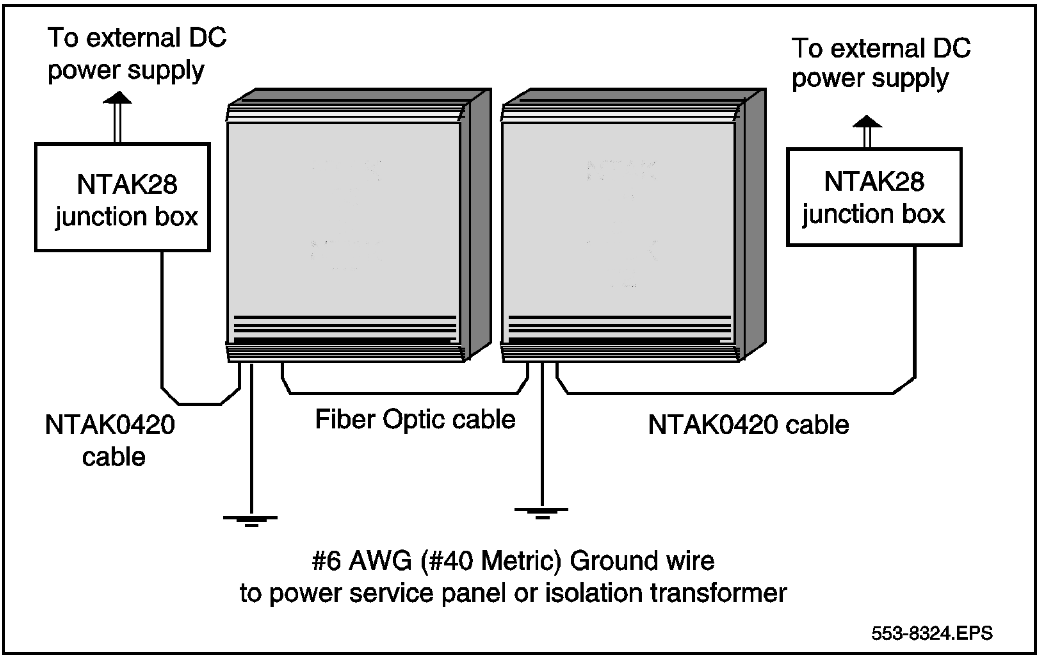
The minimum size of the conductors required between the DC source and the Junction box is shown in Figure 7 on page 52.

Table 7
Recommended wire size

Size (AWG)	Size (Metric)	Maximum Length (one way)
6	#40	50 ft (15 m)
8	#35	30 ft (9 m)
10	#25	20 ft (6 m)

Connect these components together as shown in Figure 18. Make sure the Option 11C main cabinet ground post is connected to the building ground reference by a minimum AWG #6 (metric #40) insulated conductor. Connect the input terminals of the NTAK28 Junction box to a clean DC power source meeting the requirements shown in Table 6 on page 51.

Figure 18
DC power supply connections


To external DC power supply
To external DC power supply
NTAK28 junction box
NTAK28 junction box
NTAK0420 cable
Fiber Optic cable
NTAK0420 cable
#6 AWG (#40 Metric) Ground wire to power service panel or isolation transformer
553-8324.EPS

Auxiliary equipment power

Terminals, printers, modems, and other data units used in conjunction with the Option 11C require special wiring considerations.

Power for system equipment in the switch room must:

- be powered from the same panel or transformer as the Option 11C
- be grounded to the same panel or transformer as the Option 11C
- be tagged at the panel to prevent unauthorized interruption
- not be controlled by a switch between the breaker and the equipment.

Service receptacles for Option 11C AC systems and associated equipment must be:

- of the isolated ground type, such as NEMA IG5-15

- rated for 120 or 240 V, 15 or 20A, 50-60 Hz, 3-pole, 3-wire, grounded
- grounded to the same location so as to form a Single Point Ground.

Modem requirements

It is recommended that the system be equipped with a modem to allow remote access. Setup information for modems recommended for use with the Option 11C system is found in “Modem setup requirements” on page 214.

With or without Meridian Mail

The minimum requirement is a 1200 bps auto-answer modem.

If an error-correcting modem is connected to the Meridian 1 Option 11C system, all flow-control and error-correcting functionality of the modem must be disabled to ensure proper operation. Refer to the modem manufacturer’s instructions for information.

Maintenance and administration terminals

Setup information for Option 11C recommended terminals is found in “Terminal setup” on page 224.

A Modem Eliminator (NULL Modem without hardware handshaking) A0601397 F-F converter or A0601396 M-F converter may be required to interface the TTY to the system.

The following outlines the minimum requirements for a TTY device:

Without Meridian Mail

The minimum requirement is a VT100 compatible device when Meridian Mail is not installed, and will not be installed in the future.

With Meridian Mail

With Meridian Mail, use a VT220 compatible device.

On-site access

Each system should be equipped with an M2616 or M2008 telephone with a display assigned as a maintenance telephone.

A variety of TTY terminals can be used to access the Option 11C. However, a VT220 terminal is recommended as an on-site terminal. It can be used to perform service changes, maintenance and diagnostic functions, as well as Meridian Mail administration activities.

Remote access

Although several types of modems can be used to access the system, a 2400 baud auto-answer modem is the recommended modem and 1200 baud is the minimum. It can be used to perform service change, maintenance and diagnostic functions, as well as Meridian Mail administration activities from a remote location.

> ***Note:*** Additional maintenance functions can be performed through remote access on the Option 11C. For additional information, refer to the *Option 11C Customer Controlled Backup and Restore (CCBR)* (553-3011-330).

Cross-connect terminal requirements

Allow for future expansion and equipment changes at the cross-connect terminal.

The cross-connect terminal should have sufficient space for connecting blocks to terminate the following wires:

- ten 25-pair cables from each cabinet (the main cabinet and, if equipped, each expansion cabinet)
- six conductors comprising the AUX cable from the main cabinet
- one 25-pair cable from each QUA6 PFTU
- wiring from telephone sets and trunks.

IP installation requirements

Connectors for IP cabinets equipped with 100BaseF or 100BaseT daughterboards, must be identified in advance in order to secure the proper cabling cross-connect. These connectors are the responsibility of the customer.

100BaseF daughterboards

The 100BaseF expansion cabinets can be located up to 2km from the Option 11C Main cabinet or customer-supplied LAN equipment.

100BaseT daughterboards

IP Expansion cabinets equipped with 100BaseT or 100BaseF daughterboards, can be located up to 100m from the Main Option 11C cabinet or customer supplied LAN equipment.

> ***Note:*** For IP connections greater than the 100BaseT or F solutions, third-party media convertors are required. Refer to the *Option 11C and 11C Mini Technical Reference Guide* (553-3011-100) for further information.

Equipment layout plan

Before installing the Option 11C, you need to develop an equipment layout plan to determine where each system component will be positioned.

Consideration should be given to the lengths of the various cables in order to make the best use of space available. Refer to “Cables and wires” on page 31 of this guide for a complete description of Option 11C cable and wire specifications.

Preparation of the site according to the plan is critical. Site preparation consists of making sure the site is ready to accept the equipment and that items such as power outlets and backboards are correctly installed.

General layout guidelines

CAUTION

The mounting surface must be able to support at least 100 lb (45 kg). It is recommended that you secure a backboard consisting of 3/4 in. (20 mm) plywood, or other similar material, to the surface of the wall to hold the equipment.

Follow the guidelines below to assist you in positioning the system equipment. If you plan on installing one or more expansion cabinets, read the section called "Additional considerations for multiple-cabinet systems" on page 58.

- The recommended method of system cabinet installation is wall-mounting. If you cannot mount the cabinets on the wall (for example, if there is not enough wall space), you can mount each cabinet on an optional pedestal. However, you will still need wall space for installing a cross-connect terminal and other optional equipment.
- Each Option 11C cabinet measures 25 in. (635 mm) high by 22 in. (560 mm) wide by 12 in. (305 mm) deep, or 14 in. (356 mm) deep with the newer Option 11C door.
- Leave adequate space for one or more expansion cabinets. When possible, mount the expansion cabinets next to each other horizontally (horizontal expansion) to ensure proper heat dissipation.
- If horizontal expansion is not possible, vertical expansion is permitted for two cabinets. Make sure the expansion cabinet is mounted above the main cabinet.

  Vertical expansion of three or more cabinets is not recommended. Such a configuration makes reaching the topmost cabinet difficult.

  Note: Temperature limits are more stringent when expanding vertically. Review the temperature limits stated in the *Environmental requirements* section of this guide before deciding to expand vertically. Do not install an expansion cabinet on top of an existing floor-mounted cabinet.

- When planning for a system that is equipped with DTI/PRI capability, allow space on the backboard for the channel service unit (CSU).
- Leave at least 6 in. (155 mm) above the mounting bracket and any obstruction (such as a pipe or conduit) so that there is room to lift the cabinet on and off the bracket.
- Leave at least 12 in. (305 mm) between the top of a cabinet and the ceiling to ensure proper ventilation.
- Leave 10 in. (255 mm) between the bottom of the lower cabinet and the floor to prevent water damage and to allow for convectional cooling.

- Do not place the cross-connect terminal above a cabinet. Debris from the cross-connect terminal may drop into the cabinet through the top ventilation slots and cause damage.
- Allow adequate space for the battery backup unit, accounting for the cable-length limitation as determined by the choice of a wall-mounted or floor-mounted battery back-up unit.
- If the NTAK92 Off-premises protection module is used, allow for proper installation (according to local practices)
- Ensure power outlets are within reach of each system cabinet. Cable and wire specifications are shown in Table 2, "Cable and wire specifications," on page 31.

Additional considerations for multiple-cabinet systems

For multi-cabinet systems the following guidelines apply for both horizontal and vertical expansion:

- The maximum distance between the main cabinet and each expansion cabinet is 1.8 mi (3 km).
- The minimum distance between cabinets when mounted above one another (vertical expansion) should be 12 in. (305 mm).
- The minimum distance between cabinets when mounted next to each other (horizontal expansion) is defined by an alignment bracket as shown in Figure 21 on page 62. However, this is the minimum distance; the cabinets can be positioned further apart to suit site requirements.

  Note: The equipment layout plans shown in this chapter are applicable to fiber-optic connected cabinets installed within close proximity to each other (such as on the same wall). These layout guidelines are not as stringent if the cabinets are located in separate rooms, on different floors, or in different buildings.

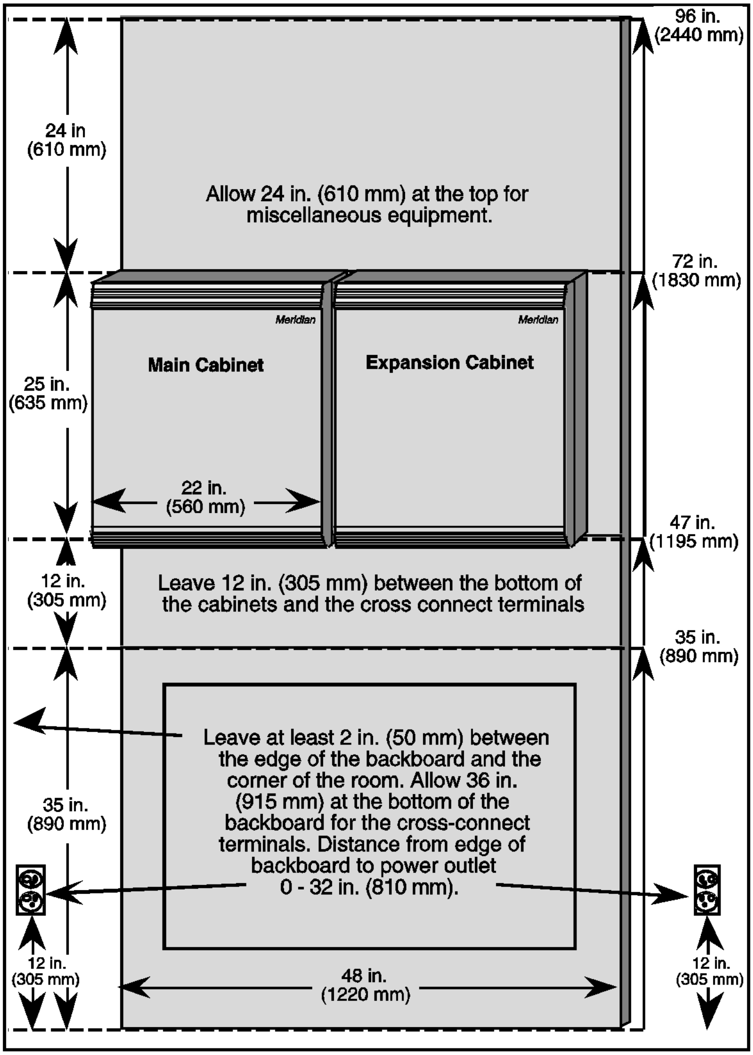
Systems using NTAK75 or NTAK76 reserve power

The mounting location of either the NTAK75 or the NTAK76 backup-up unit is governed by the location of the Option 11C cabinets and the length of the NTAK0410 cable. The NTAK0410 cable is 6 ft (1830 mm) long.

Equipment layout plan for wall mounting

Typical wall layouts using BIX cross-connection equipment are shown in Figure 20 on page 61 and Figure 22 on page 64. Use of other types of terminal blocks and equipment will alter the layout. As a result, you may need to adjust the height at which you place the cabinets in relation to other equipment. You may also need to adjust the distances the power outlets are from the backboard on AC powered systems. The positions for the mounting brackets are shown in Figure 21 on page 62.

Figure 19
Typical minimum distance layout of wall mounted cabinets (horizontal expansion)


96 in.
(2440 mm)
24 in
(610 mm)
Allow 24 in. (610 mm) at the top for miscellaneous equipment.
72 in.
(1830 mm)
Meridian
Meridian
Main Cabinet
Expansion Cabinet
25 in.
(635 mm)
22 in.
(560 mm)
47 in.
(1195 mm)
12 in.
(305 mm)
Leave 12 in. (305 mm) between the bottom of the cabinets and the cross connect terminals
35 in.
(890 mm)
Leave at least 2 in. (50 mm) between the edge of the backboard and the corner of the room. Allow 36 in. (915 mm) at the bottom of the backboard for the cross-connect terminals. Distance from edge of backboard to power outlet 0 - 32 in. (810 mm).
35 in.
(890 mm)
12 in.
(305 mm)
48 in.
(1220 mm)
12 in.
(305 mm)

553-8326.EPS

Figure 20
Typical minimum distance layout of wall-mounted cabinets (vertical expansion)

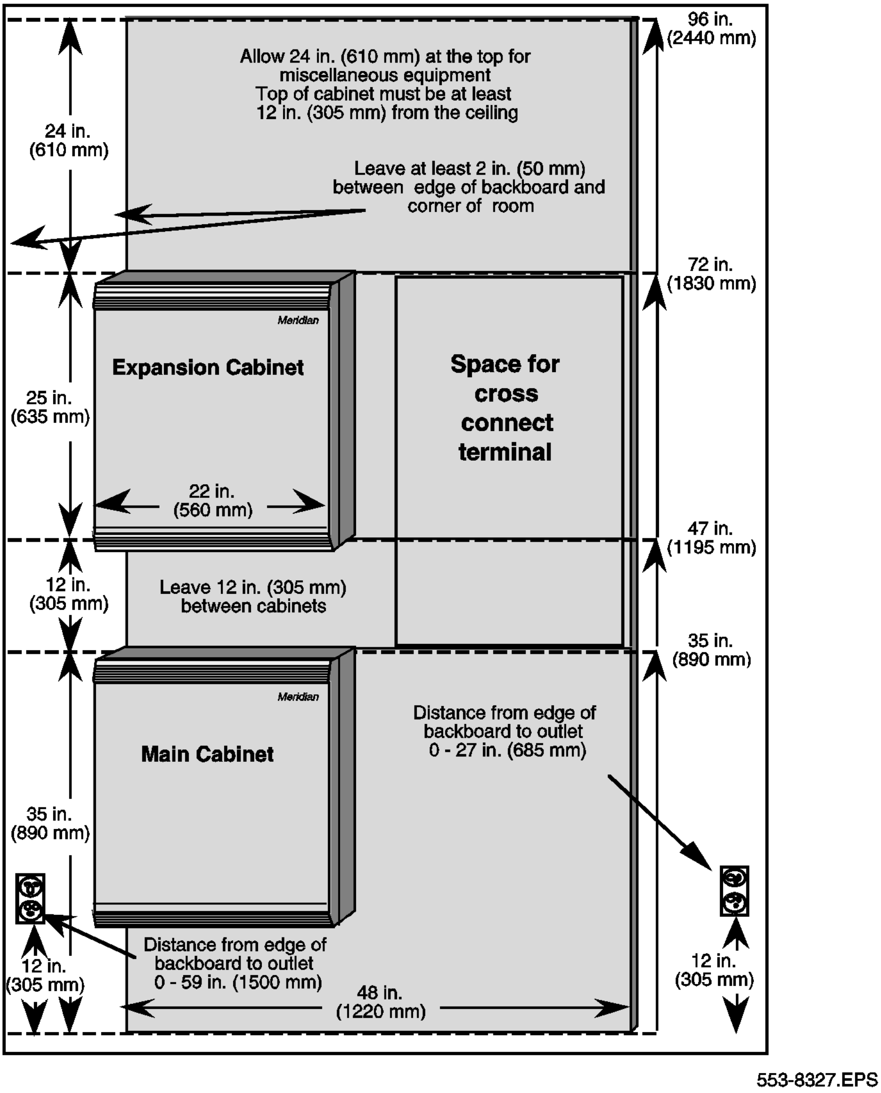
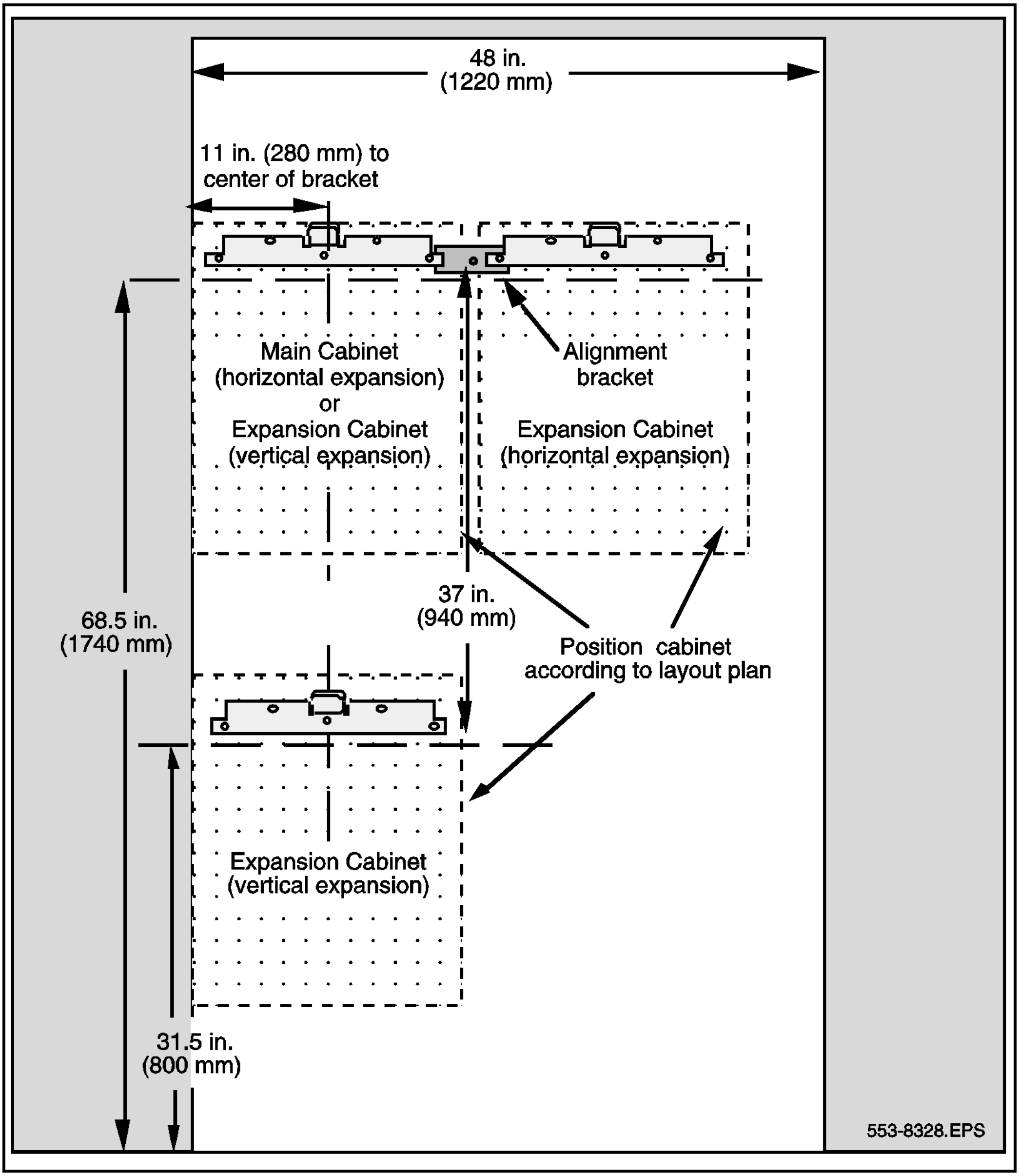

96 in.
(2440 mm)
Allow 24 in. (610 mm) at the top for miscellaneous equipment
Top of cabinet must be at least 12 in. (305 mm) from the ceiling
24 in.
(610 mm)
Leave at least 2 in. (50 mm) between edge of backboard and corner of room
72 in.
(1830 mm)
Meridian
Expansion Cabinet
Space for cross connect terminal
25 in.
(635 mm)
22 in.
(560 mm)
47 in.
(1195 mm)
12 in.
(305 mm)
Leave 12 in. (305 mm) between cabinets
35 in.
(890 mm)
Meridian
Main Cabinet
Distance from edge of backboard to outlet 0 - 27 in. (685 mm)
35 in.
(890 mm)
12 in.
(305 mm)
Distance from edge of backboard to outlet 0 - 59 in. (1500 mm)
48 in.
(1220 mm)
12 in.
(305 mm)
553-8327.EPS

Figure 21
Mounting bracket position


48 in.
(1220 mm)
11 in. (280 mm) to
center of bracket
Main Cabinet
(horizontal expansion)
or
Expansion Cabinet
(vertical expansion)
Alignment
bracket
Expansion Cabinet
(horizontal expansion)
68.5 in.
(1740 mm)
37 in.
(940 mm)
Position cabinet
according to layout plan
Expansion Cabinet
(vertical expansion)
31.5 in.
(800 mm)
553-8328.EPS

The equipment layout plan for floor mounting

An optional cabinet pedestal is used for floor-mounting when it is not possible to mount the cabinets on a wall.

The available floor space must be large enough to accommodate the main cabinet and one, or more expansion cabinets, as shown in Figure 22 on page 64.

> ***Note:*** Although you may be installing only a main cabinet at this time, leave enough space for expansion cabinets to avoid problems in the future.

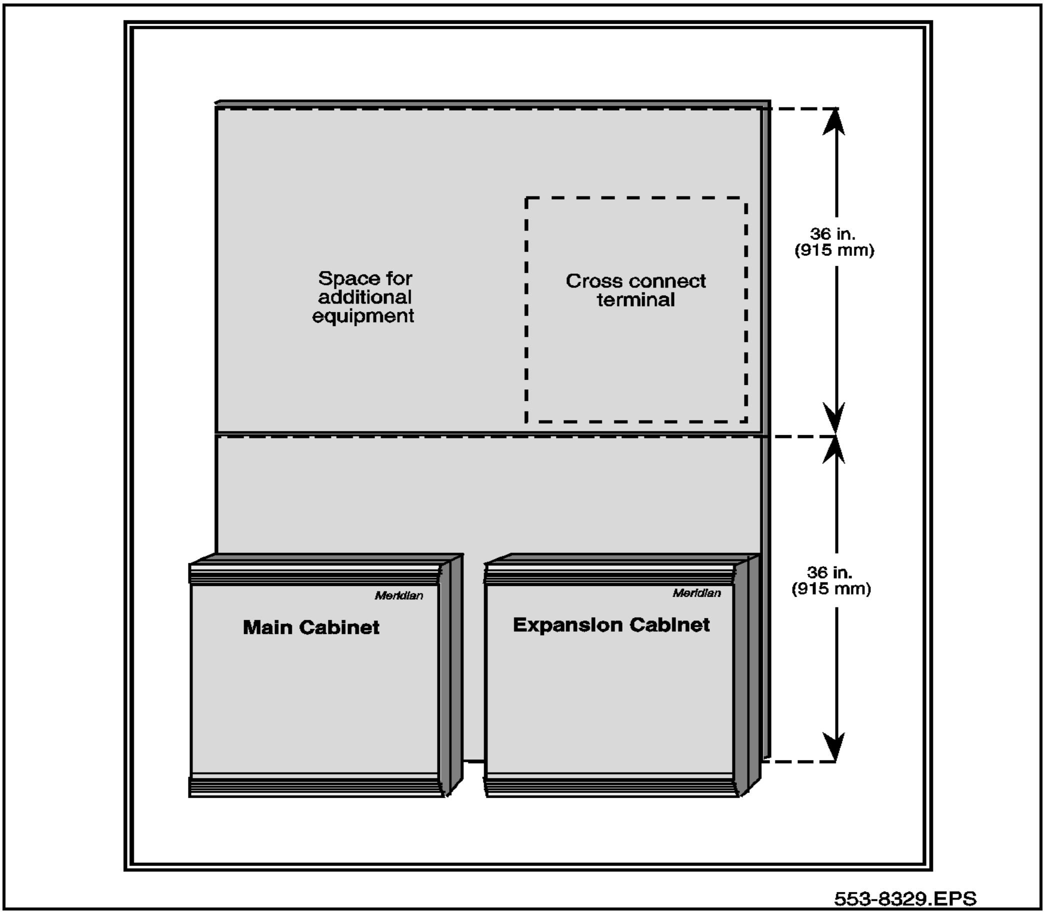
Wall space must be available for the cross connect terminal, the cross-connect cables, the NTAK76 battery unit if required, and any miscellaneous equipment (such as a power supply for digit displays on telephones).

CAUTION

Make sure that cabinet placement does not allow debris from sources such as cross-connect terminal activities to fall into the ventilation slots located at the top of the cabinet.

Leave at least 12 in. (305 mm) of space between the top of the cabinet and any obstruction (such as a shelf) to permit adequate air circulation.

Figure 22
Typical layout of floor mounted cabinets

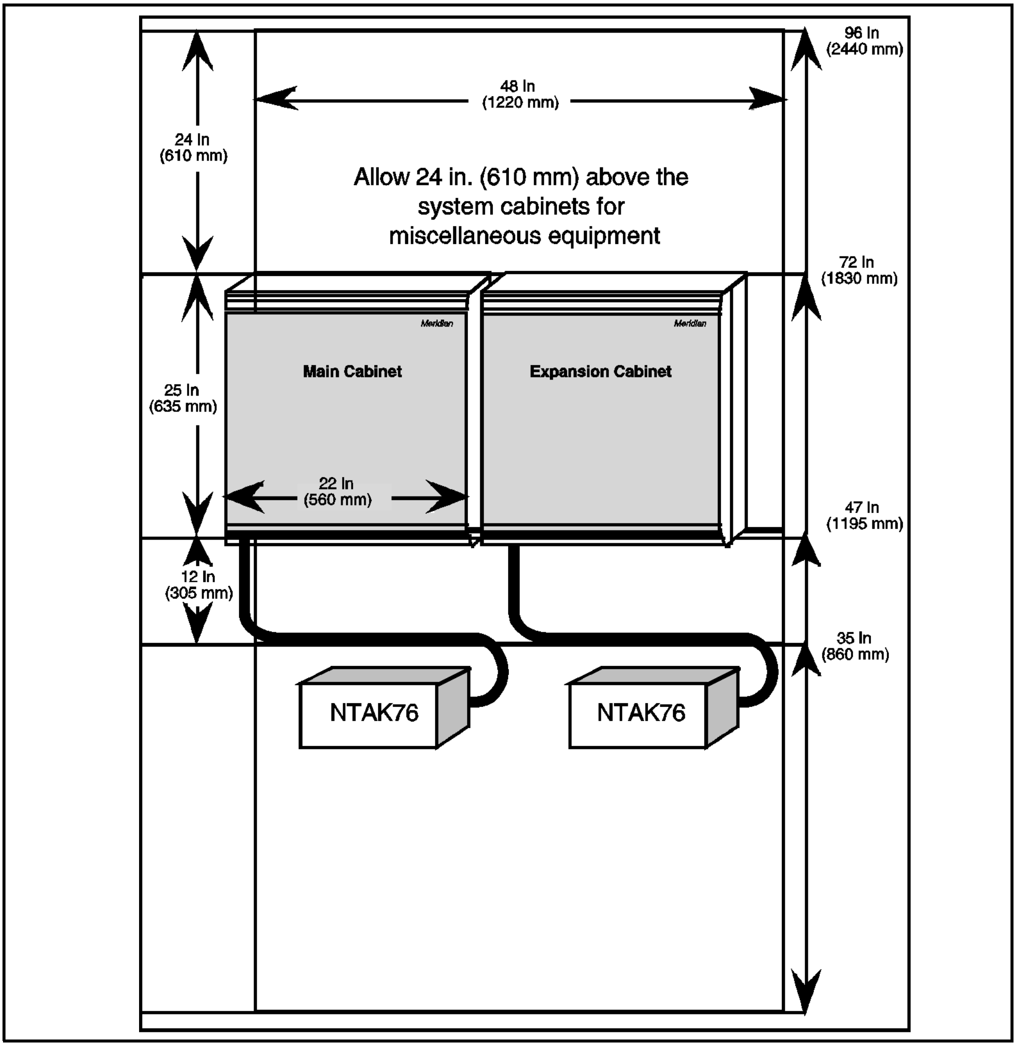


Space for additional equipment
Cross connect terminal
36 in. (915 mm)
36 in. (915 mm)
Meridian
Main Cabinet
Meridian
Expansion Cabinet
553-8329.EPS

Reserve power supply layout and installation planning

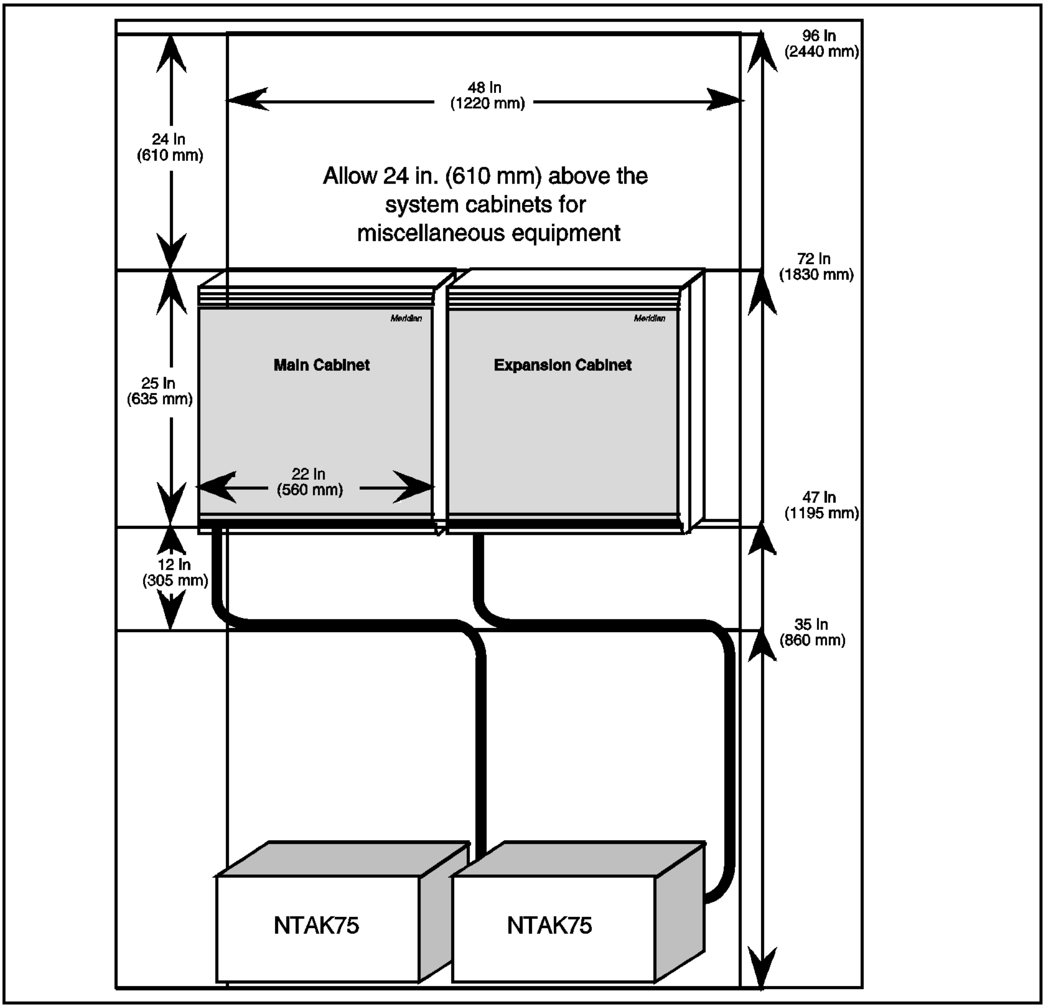
The mounting location of either the NTAK75 or the NTAK76 reserve power unit is governed by the location of the main and expansion cabinets, and the length of the NTAK0410 cable (the NTAK0410 cable is 6 ft [1830 mm] long). Below each of the figures on the following pages, you will find information detailing the maximum distance the center line of the battery unit may be placed from the cabinet center line.

Figure 23
Typical placement of NTAK76 (horizontal cabinet expansion)


96 In
(2440 mm)
48 In
(1220 mm)
24 In
(610 mm)
Allow 24 in. (610 mm) above the system cabinets for miscellaneous equipment
72 In
(1830 mm)
Meridian
Meridian
Main Cabinet
Expansion Cabinet
25 In
(635 mm)
22 In
(560 mm)
47 In
(1195 mm)
12 In
(305 mm)
35 In
(860 mm)
NTAK76
NTAK76

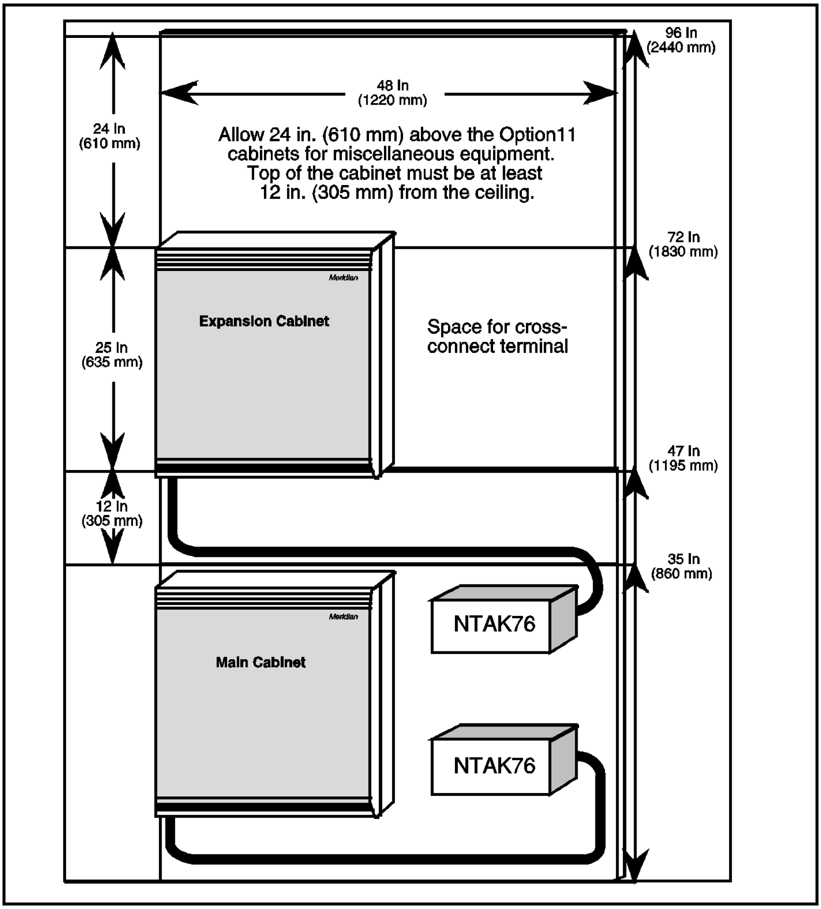
The center line of the NTAK76 may be placed a maximum of 2 ft (610 mm) to the right and 4 ft (1220 mm) to the left of the cabinet center line. These distances are based on the top of the NTAK76 being positioned 1.5 ft (460 mm) below the bottom of the cabinet.

Figure 24
Typical placement of NTAK75 (horizontal cabinet expansion)


96 In
(2440 mm)
48 In
(1220 mm)
24 In
(610 mm)
Allow 24 in. (610 mm) above the
system cabinets for
miscellaneous equipment
72 In
(1830 mm)
Meridian
Main Cabinet
Meridian
Expansion Cabinet
25 In
(635 mm)
22 In
(560 mm)
47 In
(1195 mm)
12 In
(305 mm)
35 In
(860 mm)
NTAK75
NTAK75

The center line of the NTAK75 may be placed a maximum of 0.5 ft (152 mm) to the right and 2.5 ft (760 mm) to the left of the cabinet center line. These distances are based on the cabinets being mounted at the recommended mounting heights, shown in the diagram above, for the horizontal mounting configuration.

Figure 25
Typical placement of NTAK76 (Vertical cabinet expansion)


96 In
(2440 mm)
48 In
(1220 mm)
24 In
(610 mm)
Allow 24 in. (610 mm) above the Option11 cabinets for miscellaneous equipment. Top of the cabinet must be at least 12 in. (305 mm) from the ceiling.
72 In
(1830 mm)
Meridian
Expansion Cabinet
Space for cross-connect terminal
25 In
(635 mm)
47 In
(1195 mm)
12 In
(305 mm)
35 In
(860 mm)
Meridian
Main Cabinet
NTAK76
NTAK76

The center line of the NTAK76 may be placed a maximum of 2 ft (610 mm) to the right and 4 ft (1220 mm) to the left of the cabinet center line. These distances are based on the top the upper NTAK76 being positioned 1.5 ft (460 mm) below the bottom of the Expansion Cabinet, and the bottom of lower NTAK76 being positioned 1.5 ft (460 mm) below the bottom of the Main Cabinet.

Figure 26
Typical placement of NTAK76 (Three-cabinet system)

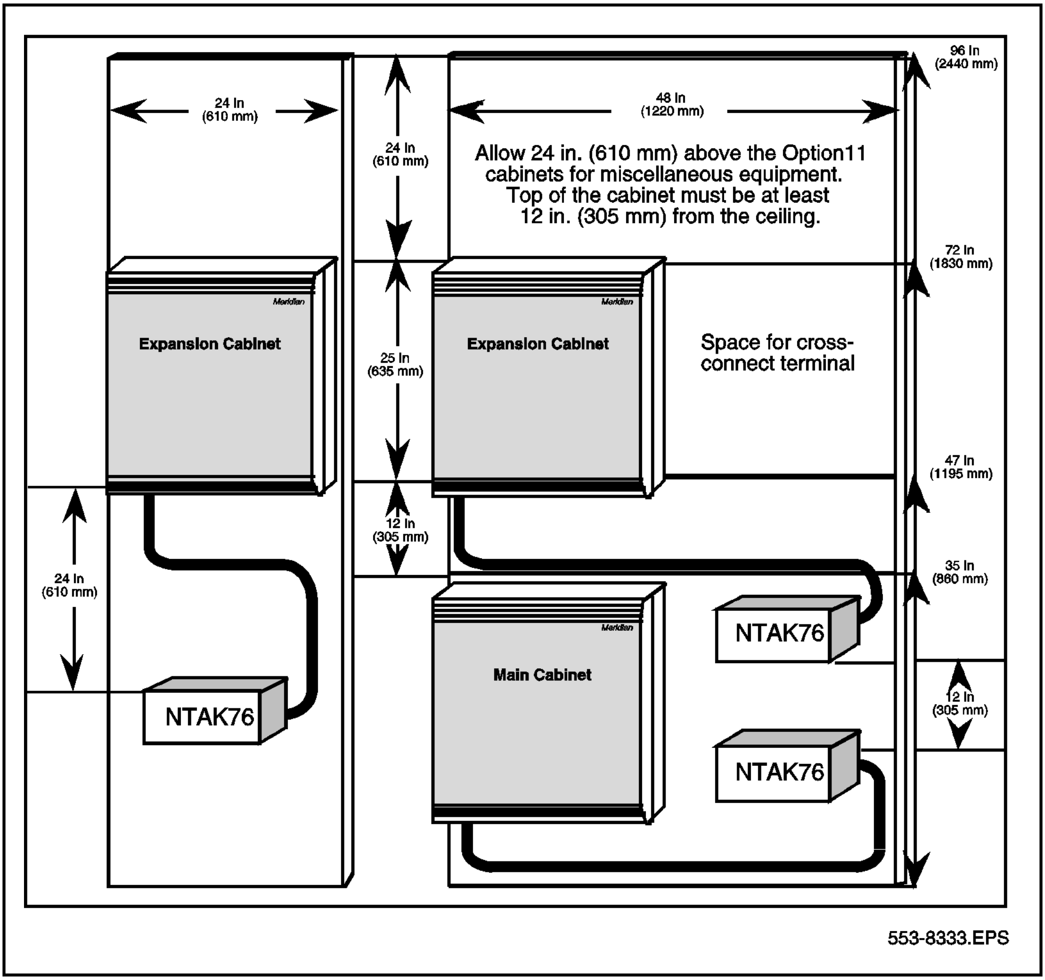
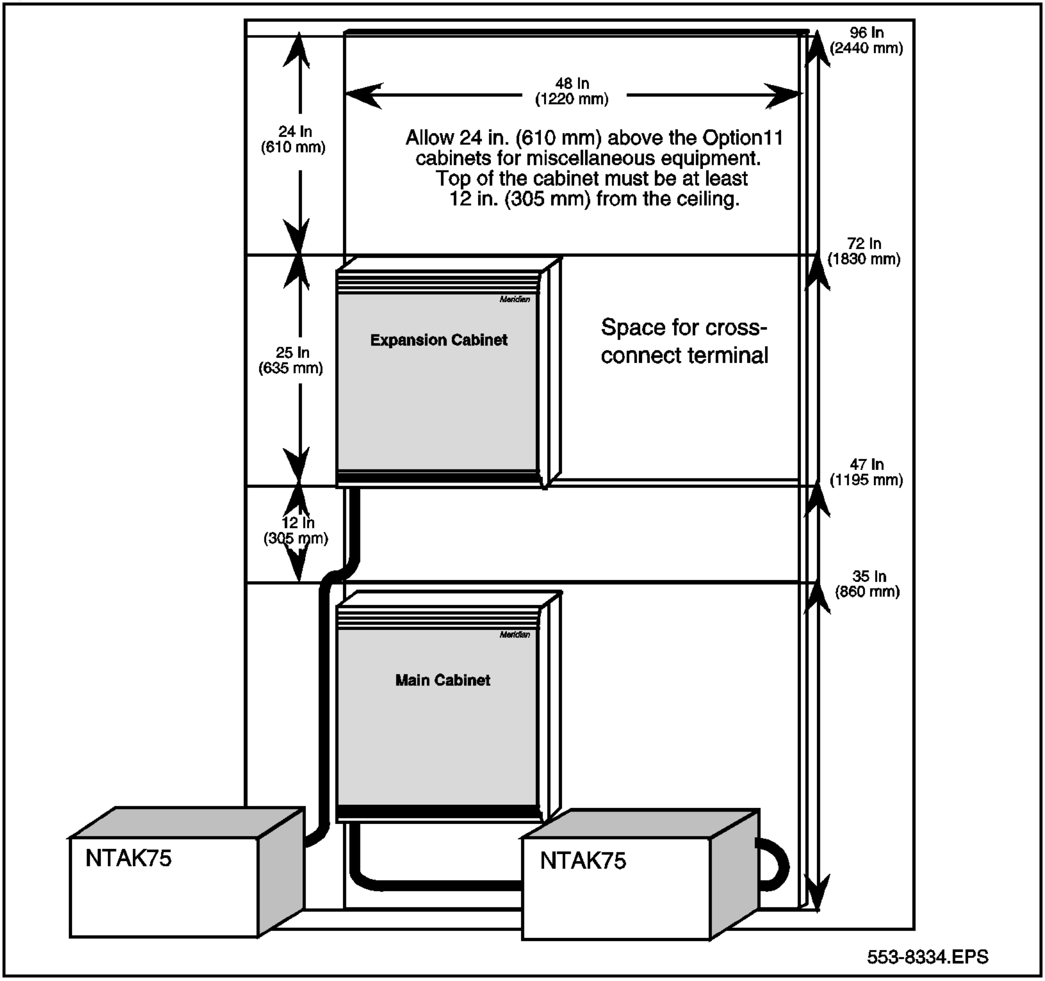
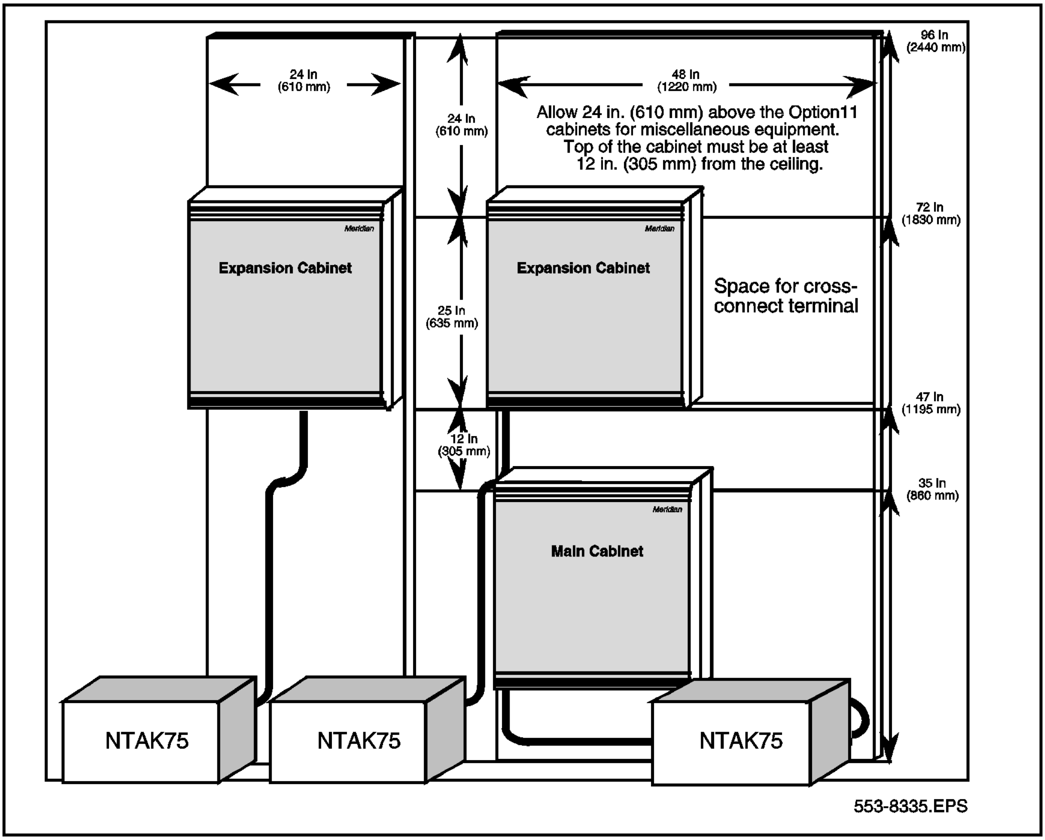

24 In (610 mm)
24 In (610 mm)
48 In (1220 mm)
96 In (2440 mm)
Allow 24 in. (610 mm) above the Option11 cabinets for miscellaneous equipment. Top of the cabinet must be at least 12 in. (305 mm) from the ceiling.
72 In (1830 mm)
Meridian
Expansion Cabinet
25 In (635 mm)
Meridian
Expansion Cabinet
Space for cross-connect terminal
47 In (1195 mm)
12 In (305 mm)
35 In (860 mm)
24 In (610 mm)
Meridian
Main Cabinet
NTAK76
NTAK76
12 In (305 mm)
NTAK76
553-8333.EPS

Figure 27
Typical placement of NTAK75 (Vertical cabinet expansion)


96 In
(2440 mm)
48 In
(1220 mm)
24 In
(610 mm)
Allow 24 in. (610 mm) above the Option11 cabinets for miscellaneous equipment. Top of the cabinet must be at least 12 in. (305 mm) from the ceiling.
72 In
(1830 mm)
Meridian
Expansion Cabinet
Space for cross-connect terminal
25 In
(635 mm)
47 In
(1195 mm)
12 In
(305 mm)
35 In
(860 mm)
Meridian
Main Cabinet
NTAK75
NTAK75
553-8334.EPS

The center line of the NTAK75 for the Expansion Cabinet may be placed a maximum of 2.5 ft (760 mm) to the left of the center line of the cabinet. The center line of the NTAK75 for the Main Cabinet may be placed a maximum of 2 ft (610 mm) to the right of the center line of the cabinet. These distances are based on the cabinets being mounted at the recommended heights, as shown in the diagram above, for the vertical mounting configuration.

Figure 28
Typical placement of NTAK75 (Three-cabinet system)


24 In (610 mm)
48 In (1220 mm)
96 In (2440 mm)
24 In (610 mm)
Allow 24 in. (610 mm) above the Option11 cabinets for miscellaneous equipment. Top of the cabinet must be at least 12 in. (305 mm) from the ceiling.
72 In (1830 mm)
Expansion Cabinet
Expansion Cabinet
Space for cross-connect terminal
25 In (635 mm)
47 In (1195 mm)
12 In (305 mm)
35 In (860 mm)
Main Cabinet
Meridian
NTAK75
NTAK75
NTAK75
553-8335.EPS

Card slot assignments

A card slot allocation plan showing circuit card to slot assignments should be prepared in advance for each cabinet. See the most current Option 11C product bulletins for minimum vintage requirements.

Be sure to allocate the cards to the main cabinet which must reside there first. Fill in the remaining card slots as required.

The NDK20EA Small System Controller (SSC) card must be installed in the SSC slot (slot 0) of the main and IP expansion cabinets.

The following card MUST be installed in the main cabinet slots 1-9:

- NT6D70 when used as a clock controller.

If you plan on using the preassigned numbering plan with consecutive numbers, it is important to assign all line cards in consecutive card slots. To prepare the plan, list the total number of the following circuit cards required for the installation:

Used only in the main cabinet

NT6D70 SILC _______ (if clock controller is active)

Meridian Mail ________

Used only in expansion cabinets

NTDK23 10 m Fiber receiver ________

NTDK25 or NTDK80
3 km Fiber receiver ________

Used in the main and expansion cabinets

NDK20EA SSC ____1___ (one per cabinet)

NTAK02 SDI/DCH ________

NTAK03 TDS/DTR ________

NTAK09 1.5 Mb DTI/PRI ________

NTDK79, 2.0 Mb PRI ________

NTDK10, 2.0 Mb DTI ________

NTRB21, 1.5 Mb TMDI ________

NTDK50, 2.0 Mb PRI ________

NTBK22 MISP Main Cabinet only ________

NT8D02 Digital line card ________

NT8D03 Analog line card ________

NT8D09 Message waiting ________

NT8D14 Universal Trunk ________

NT8D16 Digitone Receiver ________

NT8D15 E&M Trunk ________

NT7D16 Data Access ________

NT6D70 SILC (see) ________

NT6D71 UILC ________

NT5K02 XFALC ________

NT5K18 XFCOT ________

NT5K17 XDDI ________

NT5K19 XFEM ________

NT5K36 XDID/DOD ________

NT5K21 XMFC/MFE ________

NTAG26 XMFR ________

Note 1: The NT6D70 SILC card must be installed in the main cabinet (slots 1 through 9) if it is used as a clock controller.

Note 2: The NDK20EA SSC card must be installed in slot 0 in the Main and IP Expansion cabinets.

Note 3: Each Fiber expansion cabinet must have either an NTDK23, NTDK25 or NTDK80 Fiber-receiver card positioned in slot 0.

.

CAUTION

If NE-A25B cables are used instead of NTAK19AA and NTAK19BA cables with the NTAK02 and NTAK03 cards, proceed with care. NE-A25B cables are not wired out to station equipment or trunk circuits. They may only be wired out to SDI circuits.

Figure 29
Option 11C Main Cabinet

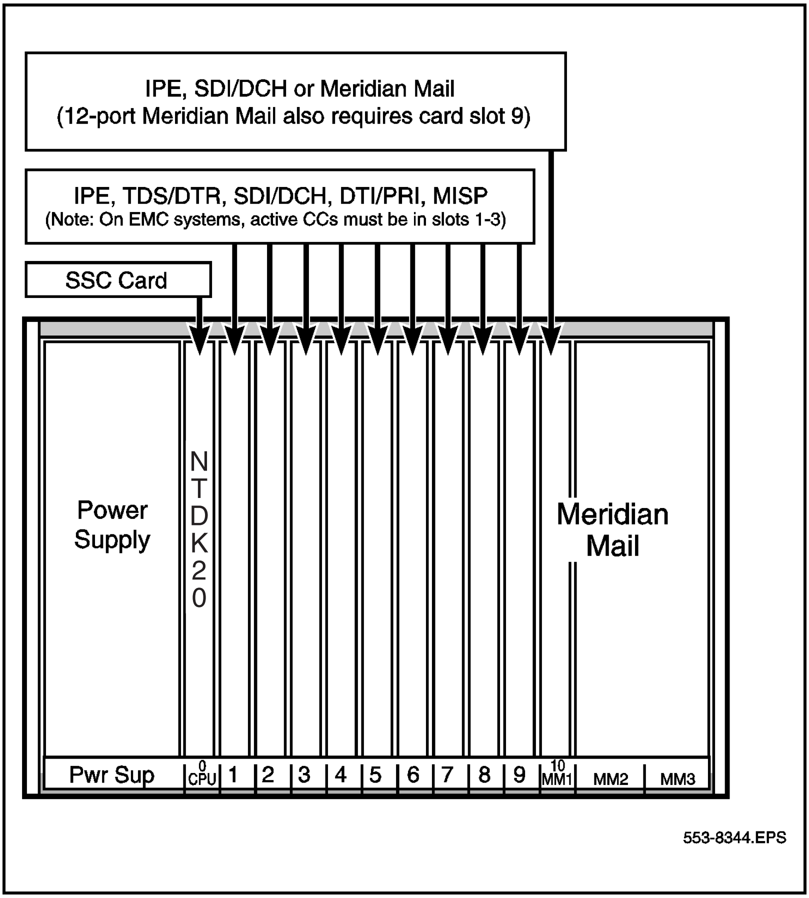
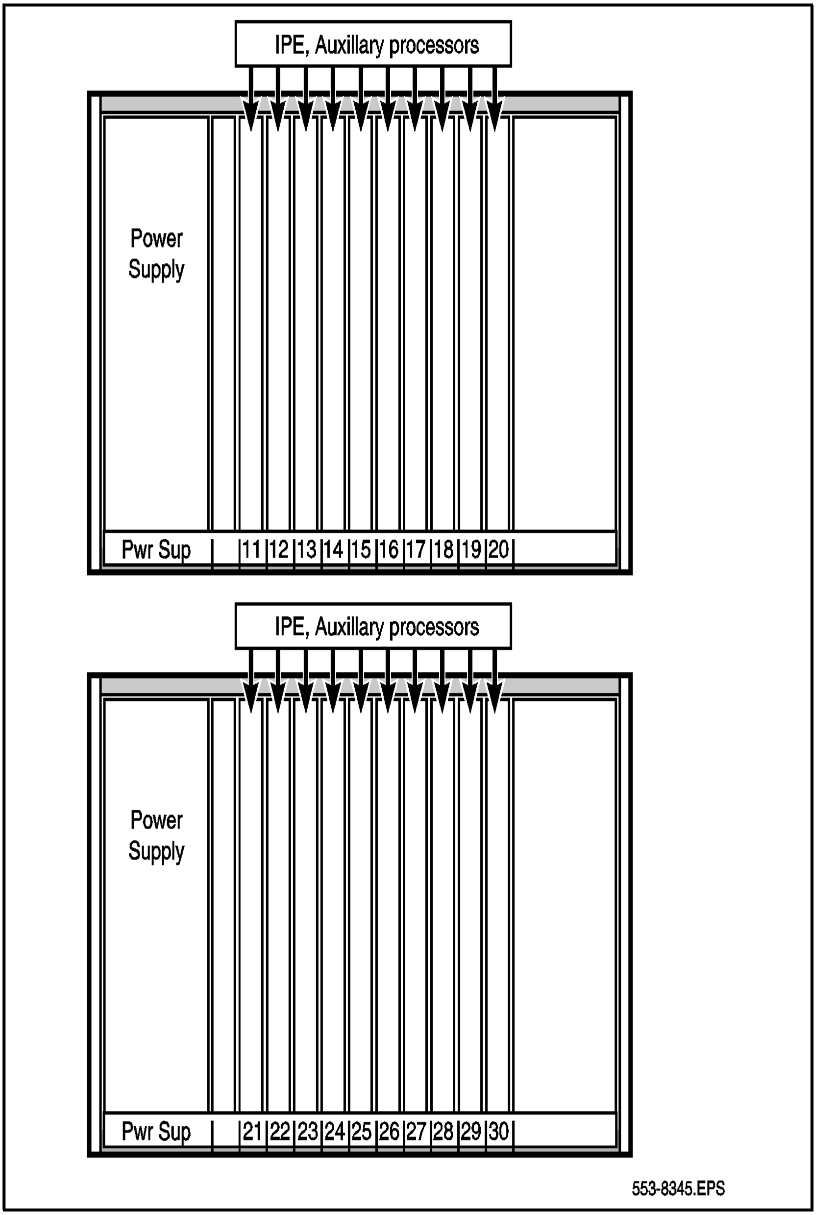

IPE, SDI/DCH or Meridian Mail
(12-port Meridian Mail also requires card slot 9)
IPE, TDS/TDR, SDI/DCH, DTI/PRI, MISP
(Note: On EMC systems, active CCs must be in slots 1-3)
SSC Card
Power Supply
NTDK20
Meridian Mail
Pwr Sup
0 CPU
1
2
3
4
5
6
7
8
9
10 MM1
MM2
MM3
553-8344.EPS

Figure 30
Option 11C IP Expansion Cabinets


IPE, Auxillary processors
Power Supply
Pwr Sup
11
12
13
14
15
16
17
18
19
20
IPE, Auxillary processors
Power Supply
Pwr Sup
21
22
23
24
25
26
27
28
29
30
553-8345.EPS

Regulatory information

Contents

This section contains information on the following topics:

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Hearing aid compatibility 77
Notice for Canadian installations 78
Notice for International installations 79
European compliance information 79
Canadian and U.S.A. Network connections 80
FCC compliance: registered equipment for Direct Inward Dial (DID) calls 80
Radio and TV interference 83
Information for the United States 83
Information for Canada 83

General information

This chapter includes regulatory information for American, Canadian and International installations pertinent to the Option 11C system installation.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable.

Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

Notice for United States installations

The Meridian 1 Option 11C system complies with Part 68 of the FCC rules. On the lower left corner of each system cabinet is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. If requested, this information must be provided to the telephone company.

Meridian 1 Option 11C regulatory labels include:

- FCC registration: AB6982-14234-MF-E
- FCC registration: AB6982-62937-PF-E
- FCC registration: AB6CAN-61117-MF-E
- FCC registration: AB6CAN-61116-PF-E
- FCC registration: AB6USA-18923-KF-E
- FCC registration: AB6CAN-18924-KF-E
- Service code: 9.0F, 6.0P.

Importance of Ringer Equivalence Number

The FCC regulation label includes the Ringer Equivalence Number (REN). This number is a representation of the electrical load that will be applied to your telephone line once the PBX is plugged into the wall jack. The telephone line serving your premises will not operate properly if the total ringer load exceeds the capability of the telephone company central office equipment. That is, if too many ringers are connected to the line, there may be insufficient energy to ring your system. If the ringer load is excessive, you may also have difficulty dialing telephone numbers.

For more information about the total REN permitted for your telephone line, contact your local telephone company. However, as a guideline, a total REN of five should allow normal operation of your equipment.

If your Meridian 1 Option 11C equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. The telephone company may ask you to disconnect the equipment from the network until the problem has been corrected, or you are sure that the equipment is not malfunctioning. If it is possible, they will notify you in advance of the pending disconnection. You will also be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

If you experience trouble with your Meridian 1 Option 11C equipment, contact your authorized distributor or service center in the USA for repair or warranty information. If you do not know how to contact your distributor, call 1-800-328-8800.

Hearing aid compatibility

All proprietary telephones used with the Meridian 1 Option 11C comply with the requirements of FCC Part 68 Rule 68.316 for hearing aid compatibility.

Notice for Canadian installations

The Industry Canada - formerly called the Canadian Department of Communications - label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. Industry Canada does not guarantee that the equipment will operate to the user's satisfaction.

The Load Number (LN) assigned to each terminal device is the percentage of the total load that can be connected to a telephone loop using the device. This number prevents overloading. The termination on a loop can consist of any combination of devices, provided that the total of the Load Numbers does not exceed 100. An alphabetic suffix is also specified in the Load Number for the appropriate ringing type (A or B), if applicable. For example, LN = 20 A designates a Load Number of 20 and an "A" type ringer.

Before installing any equipment, users should ensure it is permissible to be connected to the facilities of the local telecommunications company. The equipment must be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telephone company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION

The Option 11C frame ground of each system cabinet must be tied to a reliable building ground reference.

WARNING

Users should not attempt to make electrical ground connections themselves, but should contact their local electrical inspection authority or electrician.

Notice for International installations

If there is insufficient planning or technical information present for your country of operation, contact your regional telecommunications distributor or authority for assistance.

European compliance information

The Option 11C system meets the following European technical regulations: CTR 1, CTR 2, CTR 3, CTR 4, CTR 6, CTR 10, CTR 12, CTR 13, CTR 15, CTR 17, CTR 22, CTR 24, and the I-ETS 300 131.

Supported interfaces

Analog interfaces are approved based on national or European specifications. Digital interfaces are approved based on European specifications.

Safety specifications

The Option 11C system meets the following European safety specifications: EN 60825, EN 60950, EN 41003

Electromagnetic Compatibility

Table 8 shows the Electromagnetic Compatibility (EMC) specifications for the Option 11C system.

Table 8
Option 11C System EMC specifications

Emission:	EN 55022 EN 50082-1 EN 300329 ETS 300446	
Immunity:	EN 61000-4-2	Electrostatic discharge
	EN 61000-4-3	Electromagnetic field
	EN 61000 4-4	Fast transient burst

Canadian and U.S.A. Network connections

Table 9 on page 82 contains information that must be given to the local telephone company when ordering standard network interface jacks for the Option 11C system.

> ***Note:*** Table 9 includes columns for system port identification, Facility Interface Code (FIC), Service Order Code (SOC), USOC jack identification and associated Nortel equipment part numbers.

FCC compliance: registered equipment for Direct Inward Dial (DID) calls

Equipment registered for Direct Inward Dial (DID) calls must provide proper answer supervision. Failure to meet this requirement is a violation of part 68 of the FCC's rules.

Proper answer supervision is defined as follows:

- DID equipment returns answer supervision to the Central Office when DID calls are:
  - answered by the called station
  - answered by the attendant

  - routed to a recorded announcement that can be administered by the CPE user
  - routed to a dial prompt.

- DID equipment returns answer supervision on all DID calls forwarded to the Central Office. Permissible exceptions are if:
  - a call is unanswered
  - a busy tone is received
  - a reorder tone is received.

Table 9
Network connection specifications

Ports MTS/WATS	**Facility Interface Code**	**Service Order Code**	**REN**	**Network Jacks**	**Manufacturer network interface port designation**
2-Wire, LSA, L-S (2-Wire, Local Switched Access, Loop-Start)	02LS2	9.0F	1.1B	RJ21X CA21X*	NT8D14
2-Wire, LSA, G-S (2-Wire, Local Switched Access, Ground-Start)	02GS2	9.0F	1.1B	RJ21X CA21X*	NT8D14
2-Wire, LSA, R-B (2-Wire, Local Switched Access, Reverse-Battery)	02RV2-T	9.0F	0.0B	RJ21X CA21X*	NT8D14
1.544 Mbps OSI, SF	04DV9-B	6.0P	N/A	RJ48 CA48*	NTAK09
1.544 Mbps OSI, SF	04Dv9-C	6.0P	N/A	RJ48 CA48*	NTAK09
Analog PL facilities					
E&M Tie Trunk (TIE line, lossless, 2-wire type 1 E&M)	TL11M	9.0F	N/A	RJ2EX CA2EX*	NT8D15
E&M 4-Wire DRTT (TIE line, lossless, dial repeating, 2-wire type 1 E&M)	TL31M	9.0F	N/A	RJ2GX CA2GX*	NT8D15
E&M 4-Wire DRTT (TIE line, lossless, dial repeating, 2-wire type 2 E&M)	TL32M	9.0F	N/A	RJ2HX CA2HX*	NT8D15

* RJ with CA for Canada

Radio and TV interference

Information for the United States

Option 11C complies with Part 15 of the FCC rules in the U.S.A. Operation is subject to the following two conditions:

- Option 11C may not cause harmful interference.
- Option 11C must accept any interference received, including interference that may cause undesired operation.

If the Meridian 1 Option 11C causes interference to radio or television reception, which can be determined by placing a telephone call while monitoring, the user is encouraged to try to correct the interference by the following measures:

- Reorient the receiving TV or radio antenna where this may be done safely.
- To the extent possible, relocate the receiver with respect to the telephone equipment.

If necessary, the user should consult the dealer or an experienced radio or television technician for additional suggestions. The user may also find helpful the booklet “How to Identify and Resolve Radio-TV Interference,” prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402.

Information for Canada

The Option 11C system does not exceed Class A limits for radio noise emissions from digital apparatus, as set out in the radio interference regulations of Industry Canada.

Important safety instructions

Contents

This section contains information on the following topics:

General information 85
Symbols you should recognize 85
Safety instructions when installing telephone equipment 86
Safety instructions when using telephone equipment 86
Fiber optic cable handling procedures 88

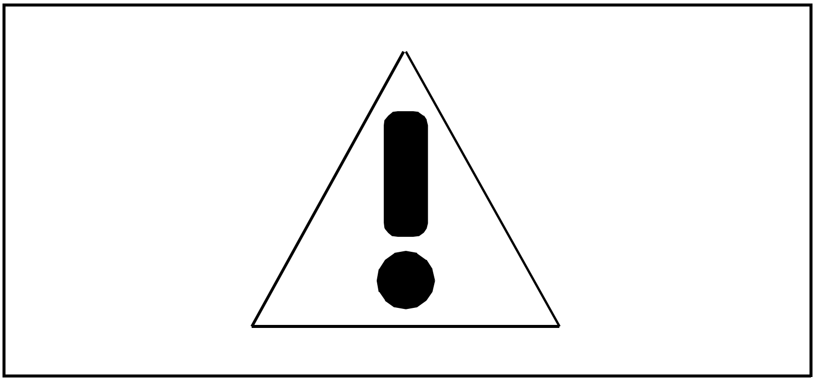
General information

SAVE THESE INSTRUCTIONS

This chapter provides important safety information for installing and using your telephone equipment. Make sure this chapter is readily available for use as a reference tool.

Symbols you should recognize

Whenever you see the symbol shown below on Option 11C equipment or documentation, it is intended to alert the you to the presence of important operating and maintenance instructions.



Safety instructions when installing telephone equipment

1 Never install telephone wiring during a lightning storm.

2 Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

3 Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

4 Use caution when installing or modifying telephone lines.

Safety instructions when using telephone equipment

When using telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

1 Follow all warnings and instructions marked on the product.

2 Unplug the telephone from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

3 Do not use the telephone near water, for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement or near a swimming pool.

4 Do not place the telephone on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

5 Slots and openings in the cabinet and the back or bottom are provided for ventilation, to protect it from overheating. These openings should never be blocked or covered.

6 The openings on a telephone should never be blocked by placing the product on the bed, sofa, rug, or other similar surface. The product should never be placed near or over a radiator or heat register. The product should not be placed in a built-in installation unless proper ventilation is provided.

7 The product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply, consult your distributor.

8 Some equipment is equipped with a three-wire grounding type plug: a plug having a third grounding pin. The plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace the obsolete outlet. Do not defeat the purposes of the grounding-type plug.

Some equipment is equipped with a polarized line plug: a plug having one blade wider that the other. This plug will fit into the power outlet only one way. This also is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still doesn’t fit, contact your electrician to replace the obsolete plug. Do not defeat the purpose of the polarized plug.

9 Do not allow anything to rest on the power cord. Do not locate the product where the cord will be abused by persons walking on it.

10 Do not overload wall outlets and extension cords as this can result in the risk of fire or electrical shock.

11 Never push objects of any kind into the product through cabinet slots as they may touch dangerous voltage points, or short out parts that could result in a risk of fire or electrical shock. Never spill liquid of any kind onto the product.

12 To reduce the risk of electrical shock, do not disassemble a non-operating product.

13 Unplug the telephone from the wall outlet and refer servicing to qualified personnel under the following conditions:

  a When the power supply cord or plug is damaged or frayed

  b If liquid has been spilled into the telephone

  c If the telephone has been exposed to rain or water

  d If the telephone has been dropped or the cabinet has been damaged

  e If the product exhibits a distinct change in performance

  f If the telephone does not function properly under normal operating conditions

14 Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.

15 Do not use the telephone to report a gas leak in the vicinity of the leak.

Fiber optic cable handling procedures

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable. Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

Option 11C supports fiber optic cable interconnection between system cabinets using the following equipment:

- NTDK78 10 m Fiber Optic cable (multi-mode plastic fiber optic cable)
- NTDK84 10 m Dual Port Fiber Optic cable (multi-mode plastic fiber optic cable)
- NTDK22 10 m Fiber Expansion daughterboard (plastic fiber optic cable)
- NTDK23 10 m Fiber Receiver card (plastic fiber optic cable)

- NTDK24 3 km Fiber Expansion daughterboard (Multimode glass fiber optic cable)
- NTTK02 Dual Port IP Expansion daughterboard
- NTTK01 Single Port IP Expansion daughterboard
- NTDK85 3 km Dual Port Fiber Expansion daughterboard (Multimode glass fiber optic cable)
- NTDK25 3 km Fiber Receiver card (Multimode glass fiber optic cable)
- NTDK79 3 km Fiber Expansion daughterboard (Single Mode glass fiber optic cable)
- NTDK80 3 km Fiber Receiver card (Single Mode glass fiber optic cable)

The following safety precautions must be followed when handling fiber equipment:

- All persons handling Fiber Expansion daughterboards and Receiver cards must be Electrostatic Discharge (ESD) protected. A wrist strap provided with the cabinet also must be worn when handling fiber optic cables to prevent damage caused by static electricity.
- Always ensure the fiber optic cable is routed out of the way of any traffic through the premises.
- Never staple or bend the fiber optic cable at an extreme angle. Do not exceed the minimum bend radius of 1.5 in. (35 mm) (90° soft bend).

  Note: A conduit is not required for routing fiber optic cable between cabinets. However, if you require a conduit for identification or other reasons, use a conduit measuring a minimum of 1 in. (25 mm) in diameter.

Bracing cabinets against earthquakes

Contents

This section contains information on the following topics:

General information 91

Method for earthquake bracing 91

General information

This chapter provides important information for bracing the Option 11C system cabinets against earthquakes. Cabinets must be mounted on the wall in order to meet earthquake protection requirements.

Method for earthquake bracing

Earthquake bracing is performed by securely fastening a 3/4 in.(20 mm) sheet of plywood to the wall, then placing the system components on the backboard (not attaching them directly to the wall).

Procedure 1
Method for earthquake bracing Option 11C system cabinets

1 **Determine the size of the backboard.**

You will need a backboard that is large enough to accommodate all of your wall-mounted components. To determine the size of your backboard, refer to the wall plan that you developed according to the guidelines given in “Earthquake bracing requirements” on page 37. If you have not developed a wall plan, please do so immediately.

When you have determined the required backboard size, make sure it is within the following limits:

Table 10
Backboard size limits

	Backboard size
Minimum	2 ft by 6 ft (600 mm by 1800 mm)
Maximum	4 ft by 8 ft (1200 mm by 2400 mm)

2 Determine fastener requirements

To determine fastener requirements, you will need the following information:

- What fasteners to use.
- The minimum embedment of the fasteners into the wall.
- The vertical distance between fasteners.
- The horizontal distance between fasteners.
- For wood and metal stud walls, this requirement is determined by the spacing between wall studs, which must be within the following range:

Table 11
Stud spacing

	Stud spacing
Minimum	16 in. (400 mm)
Maximum	24 in. (600 mm)

- The required wall stud sizes for wood and metal stud walls.

Table 12
Hardware recommendations

Type of wall	Fastener	Vertical spacing between fasteners	Minimum embedment
Wood stud	#10 Wood Screws	12 in. (300 mm) on center	1 in. (25 mm)
Metal stud	#14 Sheet Metal Screws	12 in. (300 mm) on center	
Concrete	1/4 in. (6 mm) Hilti KB-II	24 in. (600 mm) on center	1 1/8 in. (28 mm)
Masonry	1/4 in. (6 mm) Ramset Redhead Dynabolt Sleeve Anchor	24 in. (600 mm) on center	

Table 13
Minimum wall stud sizes — 16 inch spacing (Part 1 of 2)

Wall Studs	Maximum Height of wall
Wood Studs	
2 X 4 (DF #2)	11 ft (3300 mm)
2 X 6 (DF #2)	19 ft (5700 mm)
Metal Studs	
2 1/2 X 20 Gauge	9 ft (2700 mm)
2 1/2 X 16 Gauge	10 ft (3000 mm)
2 1/2 X 14 Gauge	11 ft (3300 mm)
3 5/8 X 20 Gauge	12 ft (3600 mm)
3 5/8 X 18 Gauge	13 ft (3900 mm)
3 5/8 X 16 Gauge	14 ft (4200 mm)
3 5/8 X 14 Gauge	16 ft (4800 mm)

Table 13
Minimum wall stud sizes — 16 inch spacing (Part 2 of 2)

4 X 20 Gauge	14 ft (4200 mm)
4 X 18 Gauge	15 ft (4500 mm)
4 X 16 Gauge	16 ft (4800 mm)
4 X 14 Gauge	17 ft (5100 mm)
6 X 18 Gauge	20 ft (6000 mm)

Table 14
Minimum wall stud sizes - 24 inch spacing (Part 1 of 2)

Wall Studs	Maximum Height of wall
Wood Studs	
2 X 4 (DF #2)	10 ft (3000 mm)
2 X 6 (DF #2)	17 ft (5100 mm)
Metal Studs	
2 1/2 X 20 Gauge	8 ft (2400 mm)
2 1/2 X 18 Gauge	9 ft (2700 mm)
2 1/2 X 14 Gauge	10 ft (3000 mm)
3 5/8 X 20 Gauge	11 ft (3300 mm)
3 5/8 X 18 Gauge	12 ft (3600 mm)
3 5/8 X 16 Gauge	13 ft (3900 mm)
3 5/8 X 14 Gauge	15 ft (4500 mm)
4 X 20 Gauge	12 ft (3600 mm)

Table 14
Minimum wall stud sizes - 24 inch spacing (Part 2 of 2)

4 X 18 Gauge	13 ft (3900 mm)
4 X 16 Gauge	14 ft (4200 mm)
4 X 14 Gauge	16 ft (4800 mm)
6 X 18 Gauge	18 ft (5400 mm)

3 Determine the placement of fasteners

Refer to the figures on the following pages if you need assistance with the placement of fasteners on the backboard. In each figure, the minimum sized backboard (2 ft by 6 ft) and the maximum sized backboard (4 ft by 8 ft) are used as examples:

- **Figure 31 on page 96:** provides fastener locations for wood and metal stud walls with the minimum allowed stud spacing of 16 in. (400 mm).
- **Figure 32 on page 97:** provides fastener locations for wood and metal stud walls with the maximum allowed stud spacing of 24 in. (600 mm).
- **Figure 33 on page 98:** provides fastener locations for concrete and masonry walls.

Figure 31
Plywood fastener locations for wood and metal stud walls — 16 inch spacing

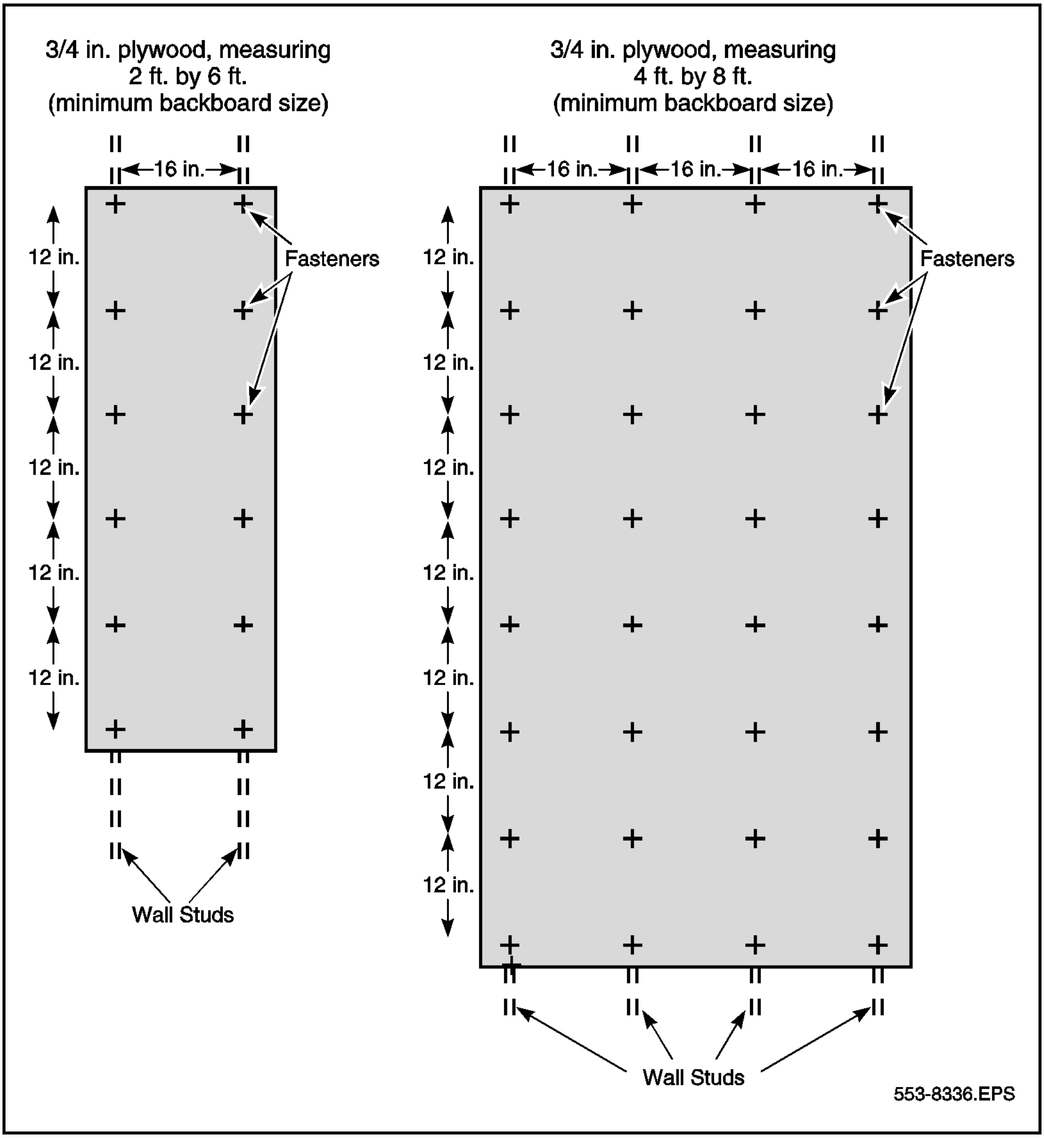

3/4 in. plywood, measuring
2 ft. by 6 ft.
(minimum backboard size)
16 in.
12 in.
12 in.
12 in.
12 in.
12 in.
Fasteners
Wall Studs
3/4 in. plywood, measuring
4 ft. by 8 ft.
(minimum backboard size)
16 in.
16 in.
16 in.
12 in.
12 in.
12 in.
12 in.
12 in.
12 in.
12 in.
Fasteners
Wall Studs
553-8336.EPS

Figure 32
Plywood fastener locations for wood and metal stud walls — 24 inch spacing

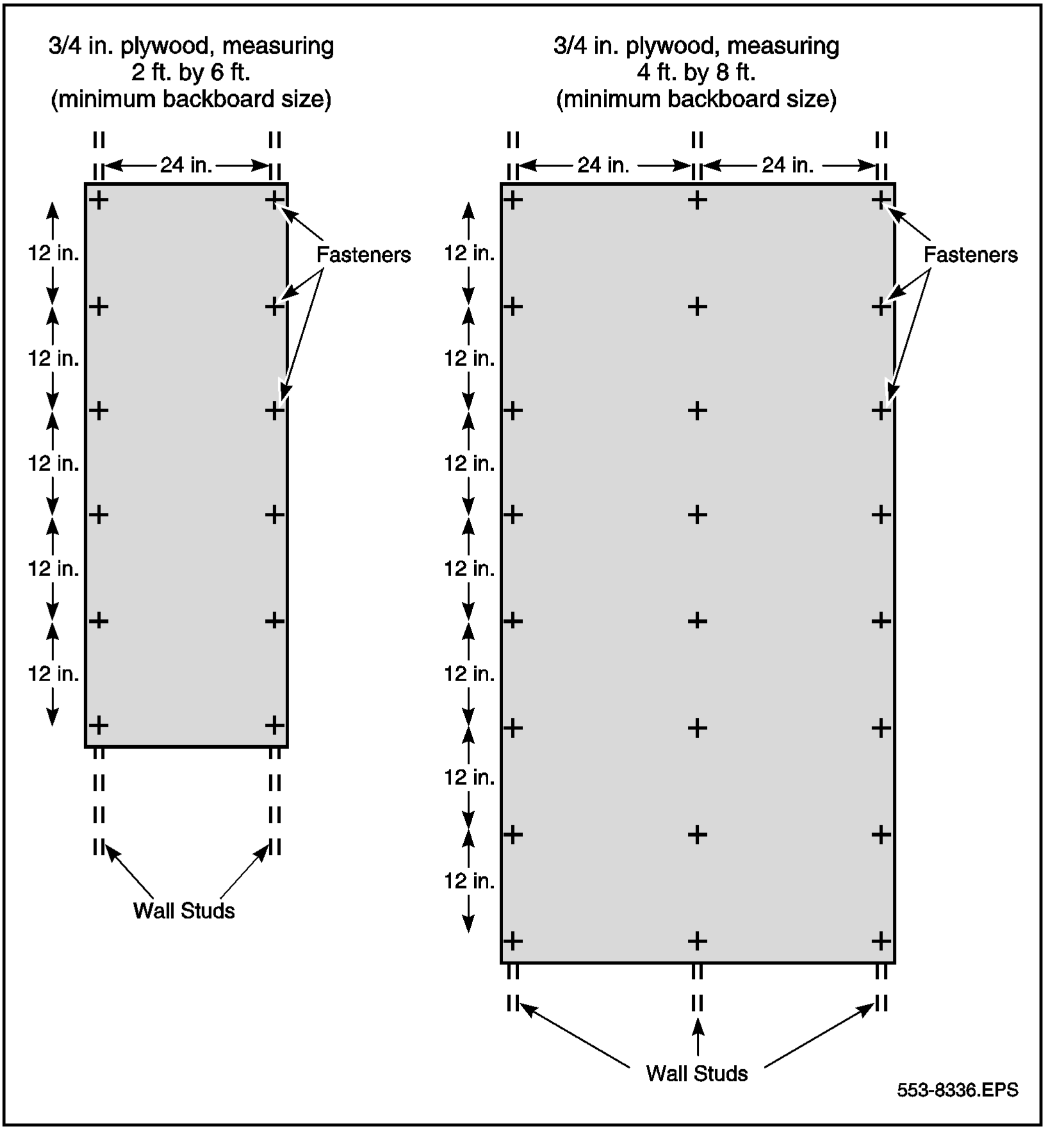
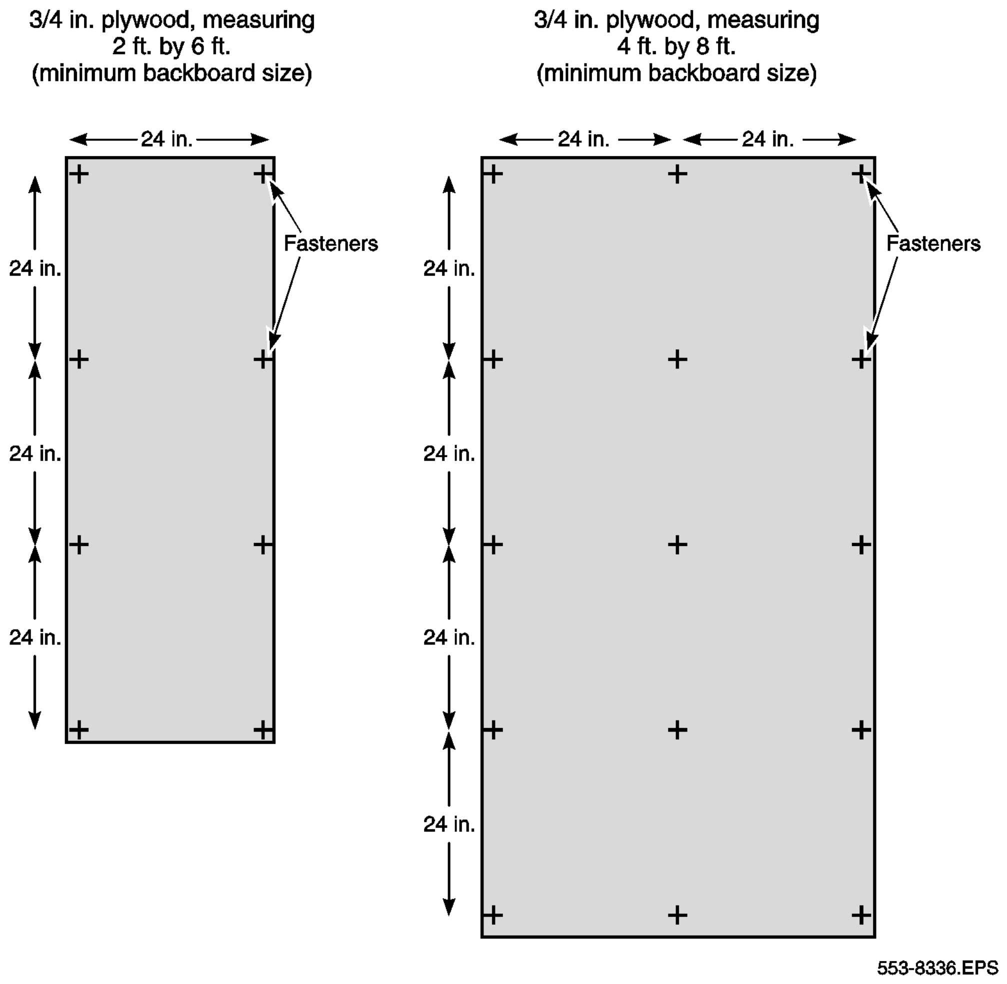

3/4 in. plywood, measuring
2 ft. by 6 ft.
(minimum backboard size)
24 in.
12 in.
12 in.
12 in.
12 in.
12 in.
Fasteners
Wall Studs
3/4 in. plywood, measuring
4 ft. by 8 ft.
(minimum backboard size)
24 in.
24 in.
12 in.
12 in.
12 in.
12 in.
12 in.
12 in.
12 in.
Fasteners
Wall Studs
553-8336.EPS

Figure 33
Plywood fastener locations for concrete and masonry walls


3/4 in. plywood, measuring
2 ft. by 6 ft.
(minimum backboard size)
24 in.
24 in.
24 in.
24 in.
Fasteners
3/4 in. plywood, measuring
4 ft. by 8 ft.
(minimum backboard size)
24 in.
24 in.
24 in.
24 in.
24 in.
24 in.
Fasteners
553-8336.EPS

4 Proceed with Option 11C system installation

Now that you have securely fastened the backboard to the wall, you can proceed with the Option 11C system Installation.

Preparing for installation

Contents

This section contains information on the following topics:

General information 99

Tools checklist 99

Readiness checklist 100

General information

Before proceeding with the installation, make sure you have all the tools necessary to install the Option 11C. Next, make sure you have checked for all site requirements, received all equipment, and have prepared an equipment layout plan and card slot assignment plan.

Tools checklist

To properly install the system, make sure that the following tools are available before starting to assemble the components:

- a variety of screwdrivers
- a tape measure
- a level
- pliers such as side cutters and longnose pliers
- an ECOS 1023 POW-R-MATE or similar type test meter
- appropriate cable terminating tools
- a drill for drilling lead holes for screws

Readiness checklist

Have you:

- read all ***safety instructions*** in the first part of this guide?
- checked to ensure you received all the equipment that was ordered?
- made sure your area meets all environmental requirements?
- checked for all power requirements?
- checked for proper grounding facilities?
- developed an equipment layout plan for the system?
- completed the card slot allocation plan?
- assembled all the tools required to proceed with the installation?

If you have completed all of the above items, you are ready to proceed with the installation of the system.

Installation Procedures

Contents

This section contains information on the following topics:

Reference list 101

General information 101

Installing the system 101

Reference list

The following are the references in this section:

- *Option 11C and 11C Mini Fault Clearing* (553-3011-500)
- *Maintenance* (553-3001-511)

General information

This chapter is used when installing a new system, adding expansion cabinets to an existing system, or reconfiguring existing cabinets to accommodate an additional expansion cabinet. Make sure you have read and completed all instructions contained in the prior chapters of this guide.

Installing the system

Follow the steps in Procedure 2 to install a new Option 11C system. Complete each step as described before proceeding with the next step. Follow the steps in Procedure 3 to add expansion cabinets to an existing system. Implement Procedure 4 if you need to reconfigure your existing system. References may be made to other chapters in this guide in order to provide additional information.

CAUTION

Wear the anti-static wrist strap provided in the bottom of the cabinet before handling the power supplies or other circuit cards. Static electricity can damage the components of power supplies and circuit cards.

Procedure 2
New system installation

1 Install the Main Cabinet

- **a)** Mount the cabinets as described in **"Mounting the cabinets" on page 115**.
- **b)** Remove the drip tray from each cabinet to expose the cable routing grooves at the bottom rear of the cabinet.
- **c)** Install the cabinet ground wire for the main cabinet as described in "Installing the system ground" on page 125.
- **d)** Install the power supply as described in "Installing the power supplies" on page 131.
- **e)** Install the reserve power supply if required.
  Refer to "Installing and connecting reserve power supplies" on page 199.
- **f)** Install the System Controller Card and daughterboards. Refer to **"Installing System Controller Cards" on page 143**.
- **g)** Install the remaining circuit cards. Refer to "Installing the circuit cards" on page 187.
- **h)** Install the cross-connect terminal and cables. Refer to "Installing and connecting cross-connect terminals to cabinets" on page 169.
- **i)** Install the power fail transfer units (PFTUs) if provided. Refer to "Installing power fail transfer units" on page 181.
- **j)** Connect the SDI and Ethernet interfaces. Refer to "Installing and connecting SDI and ethernet ports" on page 213

2 Install expansion cabinets

a) Mount the cabinets as described in **“Mounting the cabinets” on page 115**.

b) Remove the drip tray from each cabinet to expose the cable routing grooves at the bottom rear of the cabinet.

c) Install the cabinet ground wire for the main cabinet as described in “Installing the system ground” on page 125.

d) Install the power supply as described in “Installing the power supplies” on page 131.

e) Install the reserve power supply if required.
Refer to “Installing and connecting reserve power supplies” on page 199.

f) Install the expansion cabinet controller card, daughterboards and cables. **“Installing System Controller Cards” on page 143**.

g) Install the remaining circuit cards. Refer to “Installing the circuit cards” on page 187.

h) Install the cross-connect terminal and Cables. Refer to “Installing and connecting cross-connect terminals to cabinets” on page 169.

i) Install the power fail transfer units (PFTUs) if provided. Refer to “Installing power fail transfer units” on page 181.

j) Connect the SDI and Ethernet interfaces Refer to “Installing and connecting SDI and ethernet ports” on page 213

3 For IP connectivity, do one of the following:

- For point-to-point 100BaseF connectivity, go to step 4.
- For point-to-point 100BaseT connectivity, go to step 5.
- For 100BaseT or 100BaseF connectivity over a distributed data campus network, go to step 6.

4 **For point-to-point 100BaseF connectivity, connect the Main cabinet to the IP Expansion cabinets using the A0346816 5-meter fiber cable with fiber couplers.**

- Use the supplied A0346816 ST fiber couplers to connect the ST ends on the A0817052 fiber cables coming from the Main and IP Expansion cabinets. Use one coupler to connect Tx to Rx and another coupler to connect Rx to Tx. Use a push and twist motion to secure the couplers to the cable ends.
- Connect the fiber cable from the Main cabinet to the fiber cable from the IP Expansion cabinet.

Note: The cable end labelled “A” is for Transmit (Tx) and the cable end labelled “B” is for Receive (Rx).

5 **For point-to-point 100BaseT connectivity, connect the Main cabinet to the IP Expansion cabinet using the NTTK34AA cross-over cable.**

- Use the NTTK34AA 2-meter UTP CAT 5 RJ45 cross-over cable and NTDK8305 2-meter STP CAT 5 extension cable to connect the Main and IP Expansion cabinets using the 100BaseT IP daughterboards
- Connect the NTDK8305 extension cable ends from the Main and IP Expansion cabinets to the cross-over cable.

6 To connect the Main and IP Expansion cabinets over a distributed data campus network, do the following:

- Use the A0817052 5-meter fiber cable with MT-RJ to ST connectors to connect the Main and IP Expansion cabinets using the 100BaseF IP daughterboards. The two A0817052 fiber cables are usually connected to the customer’s LAN.
- Use the NTDK8305 2-meter STP CAT 5 extension cable to connect the Main and IP Expansion cabinets using 100BaseT IP daughterboards. A customer-supplied straight-through cable is used in place of the NTTK34AA 2-meter cross-over cable.

Note: You will need to work with your local data network administrator for IP provisioning.

7 **Main Power hook-up.**

- **a)** Connect the external power supply, if not already done.

  If this system uses a commercial AC power supply, the power outlet should be tested to make sure that the correct voltage is present before plugging the power cord in the outlet.

  If the system uses an external commercial AC power supply, plug the AC power cord from each cabinet into the commercial AC power supply outlet.

  If the system uses a customer-provided DC power supply, plug the DC power cord from each cabinet into the DC power source.

- **b)** For AC-powered systems, set the circuit breaker on the NTAK04 or NTDK78 AC/DC power supply in each cabinet to ON. For DC powered systems, set the circuit breaker on the NTAK28 circuit breaker assembly for each cabinet to ON. Set the circuit breaker on the NTAK05 or NTDK72 DC power supply in each cabinet to ON.

8 **Set the circuit breaker on the battery backup unit to ON (if the system has reserve power).**

Note: A system equipped with the NTAK04 or NTDK78 AC/DC power supply and a battery backup unit will continue to operate on DC reserve power if the AC supply fails. However, if the DC reserve power is interrupted, the NTAK04 or NTDK78 cannot be powered up again until AC power is restored.

9 **Install the System Software on Main cabinet.** Refer to “System software installation” on page 233.

10 **Install the System Software on Expansion cabinet.** See “Software installation on the IP Expansion Cabinet using the preprogrammed software daughterboard” on page 244.

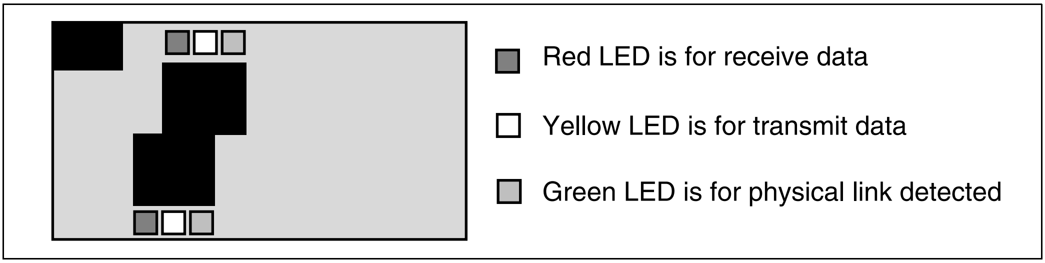
11 **Check the “Link” LED on the daughterboard.**

From left to right, the LEDs are:

- Receive LED
- Transmit LED
- Link LED (should be green)

If the Link LED is not lit and green, the hardware connection is not enabled. Check the cables and connections. Make sure the cables are not damaged. Refer to the *Option 11C and 11C Mini Fault Clearing* (553-3011-500) for further information.

Figure 34
Daughterboard LEDs


Red LED is for receive data
Yellow LED is for transmit data
Green LED is for physical link detected

12 **Configure the IP daughterboards with IP addresses, cabinet numbers and MAC addresses for both Main and IP expansion cabinets.** Use LD 117 found in *Maintenance* (553-3001-511).

13 **Install (if not previously installed) and activate the telephones.** Refer to “Connecting the telephones” on page 247.

14 **Connect the trunks to the system as described in “Connecting the trunks” on page 277**

15 **Perform a system backup, using LD 43.**

16 **Install any remaining equipment, such as external alarms (Refer to “Connecting an external alarm” on page 307) and the optional Meridian Mail feature, if provided.**

17 **Replace all drip trays and cabinet covers.**

——————————— ***End of Procedure*** ———————————

Figure 35
Cable Ends and Fiber Coupler for 100BaseF connectivity

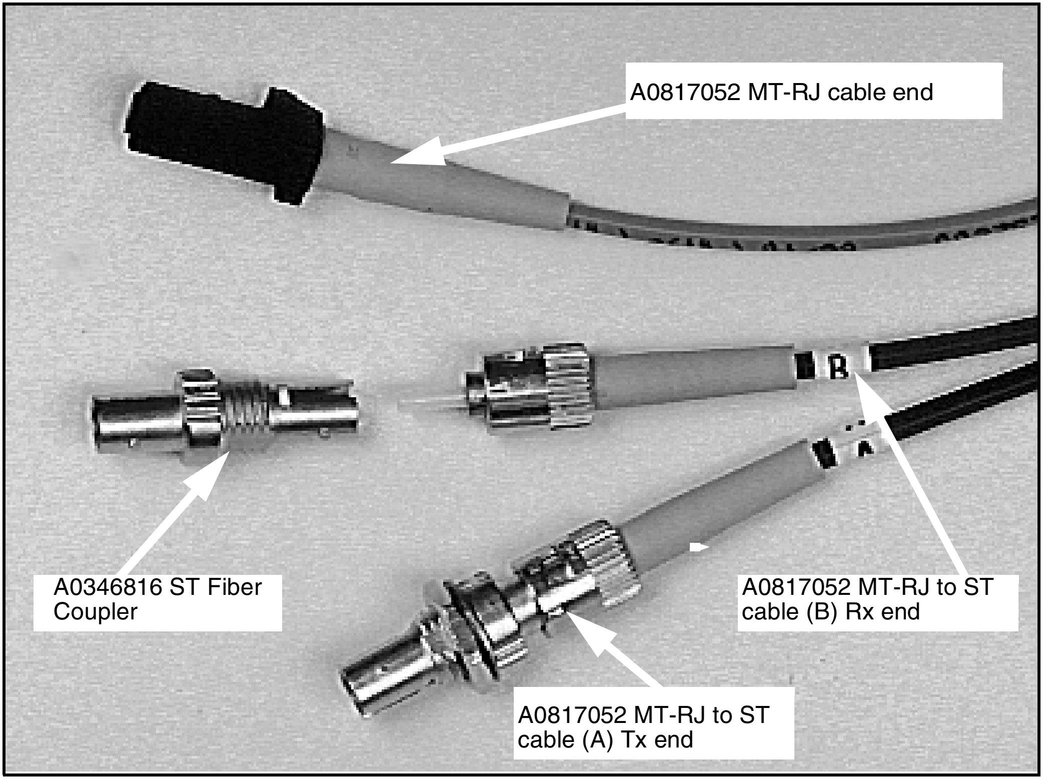
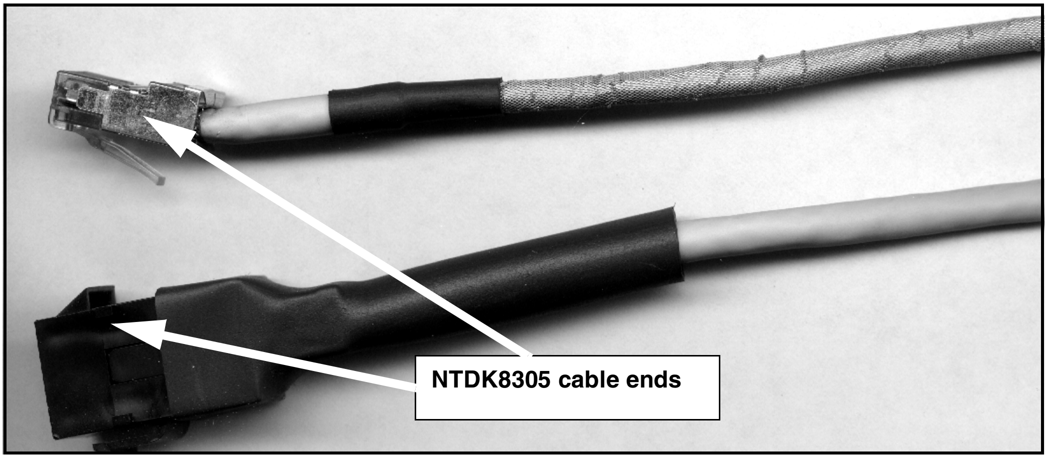

A0817052 MT-RJ cable end
A0346816 ST Fiber Coupler
A0817052 MT-RJ to ST cable (B) Rx end
A0817052 MT-RJ to ST cable (A) Tx end

Figure 36
Cable ends for 100BaseT IP connectivity



Procedure 3
Adding expansion cabinets to an existing system

1 **Install an expansion daughterboard and cable on the NDK20EA SSC in the main cabinet as described in “Installing System Controller Cards” on page 143**

2 **Install expansion cabinets**

  a) Mount the cabinets as described in “Mounting the cabinets” on page 115.

  b) Remove the drip tray from each cabinet to expose the cable routing grooves at the bottom rear of the cabinet.

  c) Install the cabinet ground wire for the main cabinet as described in “Installing the system ground” on page 125.

  d) Install the power supply as described in “Installing the power supplies” on page 131.

  e) Install the reserve power supply if required.
  Refer to “Installing and connecting reserve power supplies” on page 199.

  f) Install the expansion cabinet controller card and daughterboard. Refer to“Installing System Controller Cards” on page 143.

- **g)** Install the remaining circuit cards. Refer to “Installing the circuit cards” on page 187.
- **h)** Install the cross-connect terminal and Cables. Refer to “Installing and connecting cross-connect terminals to cabinets” on page 169.
- **i)** Install the power fail transfer units (PFTUs) if provided. Refer to “Installing power fail transfer units” on page 181.
- **j)** Connect the SDI and Ethernet interfaces. Refer to “Installing and connecting SDI and ethernet ports” on page 213

3 **For IP connectivity,** refer to Procedure 2, step 3 through step 6, on page 103 - page 104.

4 **Power up the the main and expansion cabinets.** Refer to Procedure 2, Step 7 on page 105.

5 **Install the System Software on the IP Expansion Cabinet (not required for fibre expansion cabinets).** Refer to “System software installation” on page 233**.**

6 **Install (if not previously installed) and activate the telephones.** Refer to “Connecting the telephones” on page 247**.**

7 **Connect the trunks to the system as described in “Connecting the trunks” on page 277**

8 **Perform a system backup, using LD 43.**

9 **Install any remaining equipment, such as external alarms (Refer to “Connecting an external alarm” on page 307).**

10 **Replace all drip trays and cabinet covers.**

——————————— ***End of Procedure*** ———————————

Procedure 4
Reconfiguring existing cabinets to accommodate an additional expansion cabinet

Under certain circumstances it is necessary to rearrange cabinet connections and/or configurations. Two scenarios are described.

Scenario 1: Adding a third expansion cabinet
If the existing main cabinet is equipped with two single daughterboards, and the two expansion cabinets are located within 10 m, adding another expansion cabinet within 3km requires the following steps:

1 **Replace the top daughterboard with a dual port expansion daughterboard.**

2 **If the third cabinet is within 10m, add the cabinet to port 3**. Configure the cards required for expansion cabinet 3.

3 **If the third cabinet is further than 10m, connect the two short-haul cabinets to the dual port daughterboards in ports 1 and 3.**

4 **Replace the lower 10m expansion daughterboard in the main cabinet with a 3 km expansion daughterboard.**

5 **Add the third (long-haul) cabinet to the single-port 3 km expansion daughterboard in port 2.**

6 **Reassign in software all services provided on cards 21 to 30, to cards 31 to 40.**

Scenario 2: Adding a fourth expansion cabinet
The existing main cabinet is equipped with two 10 m Dual Port expansion daughterboards connecting to three expansion cabinets. A remote expansion cabinet is to be added requiring a 3 km expansion daughterboard. Although one of the existing daughterboards has a port available, it can only be connected to a cabinet within 10 m (33 ft.). With this scenario, do the following:

1 **Select the Dual Port expansion daughterboard that is being used for only one cabinet (a spare port is available on the daughterboard).**

2 **Replace it with a 3 km Dual Port expansion daughterboard.**

3 **Replace the Receiver card in the existing companion expansion cabinet with a 3 km receiver card.**

4 **With glass optic cable, connect the existing expansion cabinet to the same port as previously assigned on the new expansion daughterboard.**

5 **Add the new cabinet to the remaining port as described in Procedure 3 on page 108**.

——————————— *End of Procedure* ———————————

Option 11C and Option 11C Mini mix-and-match expansion

In a mix-and-match scenario, an Option 11C Mini Main chassis can be connected to the Option 11C IP Expansion cabinet(s). In addition, an Option 11C Main cabinet can be connected to an Option 11C Mini IP Expansion chassis. The main differences between the Option 11C and Option 11C Mini include:

- The SSC card vintages - the SSC card NTDK20 or later is required for the Option 11C Main Cabinet, Option 11C Mini Main Chassis and IP Expansion Chassis. The SSC card vintage NTDK20CA or later is required for Option 11C Expansion Cabinets.
- The Option 11C cabinets must support the faceplate cabling that is used on all IP Expansion daughterboards. If the current cabinets do not support cable routing through the faceplate, they must be upgraded to the NTDK18AA cabinet kit.
- The grounding clips are situated differently. The Option 11C grounding clip is mounted on the front of the stiffener rail. Refer to Figure 37 on page 111. The Option 11C Mini is mounted on the fan baffle on the lower right hand side of the Mini Main chassis Refer to Figure 38 on page 112.

Figure 37
Option 11C EMC grounding clip

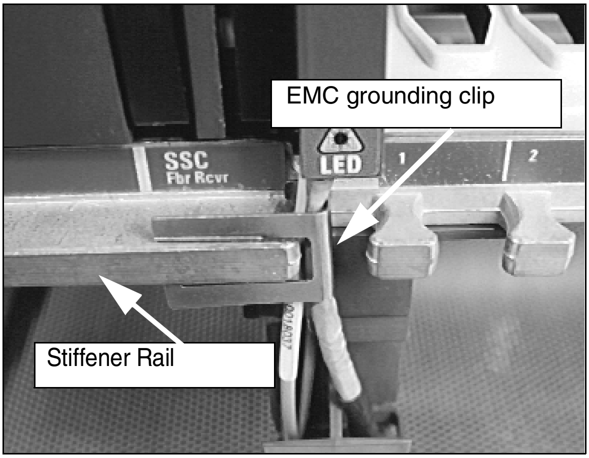


Figure 38
Option 11C Mini EMC grounding clip location

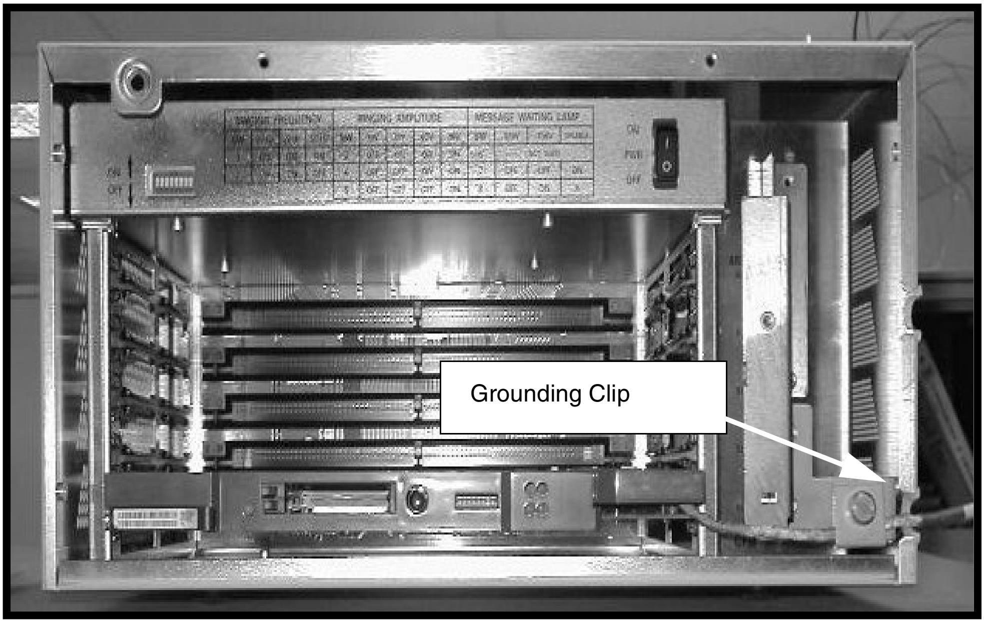
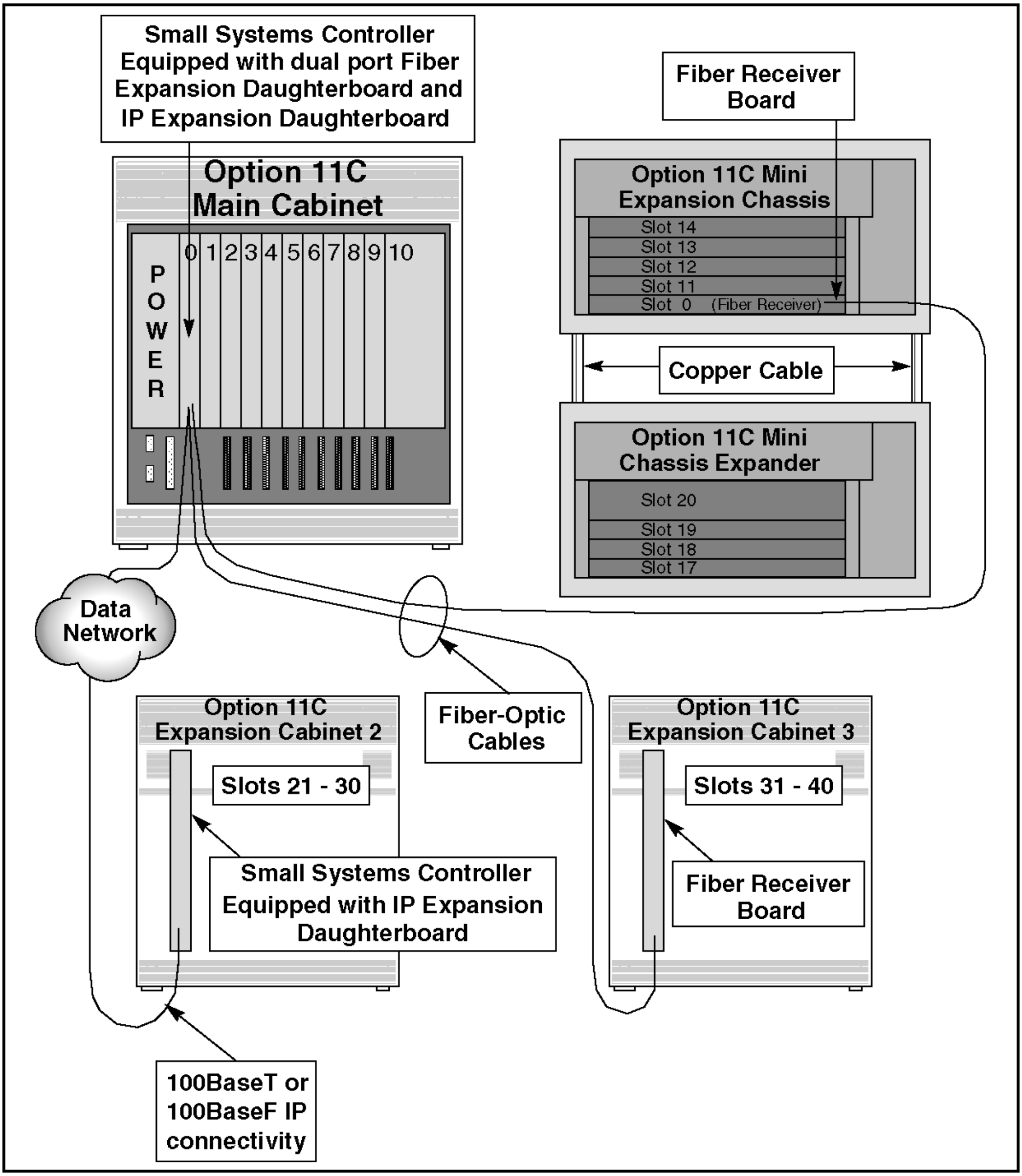


Figure 39 on page 113 shows an example "mix-and-match" configuration in which an Option 11C Main cabinet uses both fiber and IP cabling to connect two Option 11C Expansion cabinets and one Option 11C Mini Expansion chassis.

> ***Note:*** Figure 39 on page 113 is only an example of one of many possible configurations using Option 11C cabinets and Option 11C Mini chassis.

The SSC card in the Option 11C Main cabinet has one dual-port Fiber daughterboard installed in the top connector and one single-port IP daughterboard installed in the bottom connector. The dual-port Fiber daughterboard in the top connector provides card slots 11-20 and 31 to 40. The single-port IP daughterboard in the bottom connector provides card slots 21-30.

Figure 39
Option 11C and Option 11C Mini mix-and-match expansion configuration


Small Systems Controller Equipped with dual port Fiber Expansion Daughterboard and IP Expansion Daughterboard
Fiber Receiver Board
Option 11C Main Cabinet
P O W E R
0 1 2 3 4 5 6 7 8 9 10
Option 11C Mini Expansion Chassis
Slot 14
Slot 13
Slot 12
Slot 11
Slot 0 (Fiber Receiver)
Copper Cable
Option 11C Mini Chassis Expander
Slot 20
Slot 19
Slot 18
Slot 17
Data Network
Fiber-Optic Cables
Option 11C Expansion Cabinet 2
Slots 21 - 30
Small Systems Controller Equipped with IP Expansion Daughterboard
Option 11C Expansion Cabinet 3
Slots 31 - 40
Fiber Receiver Board
100BaseT or 100BaseF IP connectivity

Mounting the cabinets

Contents

This section contains information on the following topics:

General information 115
Earthquake bracing 115
Mounting the cabinet on a wall 115
Items required 115
Mounting the cabinet on the floor 120
Items required 120

General information

This chapter explains two methods of installing cabinets. Procedure 5 on page 116 describes how to mount the cabinet on a wall. Procedure 6 on page 120 describes how to mount the cabinet on the floor using a pedestal.

Earthquake bracing

If the Option 11C system cabinets require earthquake bracing, refer to "Earthquake bracing requirements" on page 37 before continuing.

Mounting the cabinet on a wall

Items required

To mount cabinets on a wall you need:

- the equipment layout plan as developed in the "Equipment layout plan" on page 56
- the mounting bracket supplied with each cabinet

- seven 1 in. #12 screws provided or other appropriate fasteners to secure the mounting bracket and cabinet to the wall
- a 3/4 in. (20 mm) sheet of plywood secured to the wall
- one 1 in. #12 screw and an alignment bracket if installing an expansion cabinet next to the main cabinet (horizontal expansion)

CAUTION

A fully loaded cabinet weighs up to 75 lb (34 kg). Make sure that the equipment is securely fastened to the wall. Use fasteners that are designed to hold securely in the type of surface chosen to support the equipment. When using 3/4 in. (20 mm) plywood or other similar material as a backboard, make sure that it is anchored directly to the wall studs in a minimum of six locations.

Procedure 5
Wall mounting

Note: If adding a cabinet next to an existing installed cabinet, start at Step 4 on page 117.

1 **Draw a level line on the plywood backboard indicating where the mounting brackets for each system cabinet will be located.**

Refer to the equipment layout plan for measurements, or refer to **"Equipment layout plan" on page 56.**

2 **Locate the mounting bracket and mounting screws shipped with each cabinet.**

3 **Rest the bottom of the bracket on the line drawn for the main cabinet and fasten the mounting bracket to the wall with five 1 in. #12 screws provided (or other suitable fasteners).**

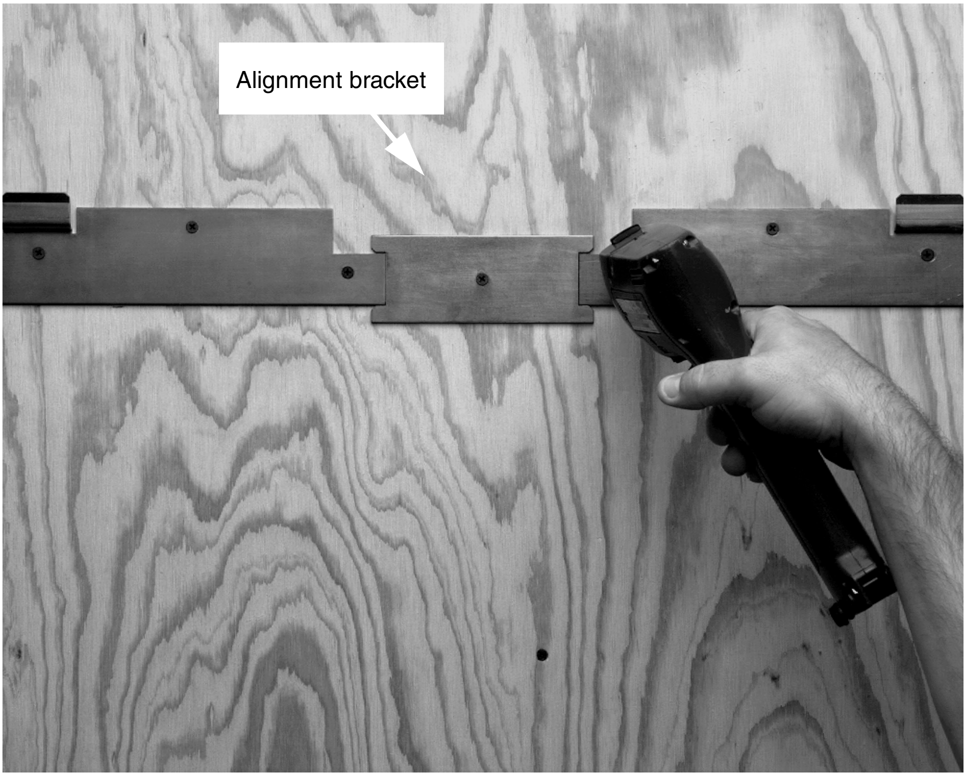
Make sure the mounting bracket is even with the line you have drawn and that the hook on the bracket is facing upward as shown in Figure 40 on page 117.

4 **Perform this step only if an expansion cabinet is to be located immediately next to the main cabinet (or an existing expansion cabinet). Otherwise, go to the next step (Step 5 on page 118).**

Fasten an alignment bracket (shipped with the cabinet) to the wall as shown in Figure 40 on page 117.

The alignment bracket determines the minimum distance between the main and expansion cabinets if mounted side-by-side. It is not required if the space between cabinets is significant.

Figure 40
Brackets for horizontal expansion



5 **Rest the bottom of the bracket on the line drawn for the expansion cabinet, and fasten the mounting bracket to the wall with five 1 in. #12 screws provided (or other suitable fasteners).**

Make sure the mounting bracket is even with the line drawn, and that the hook on the bracket is facing upward as shown in Figure 40 on page 117.

6 **Remove the main cabinet (or expansion cabinet if the main cabinet has been installed) from its carton and remove its front cover.**

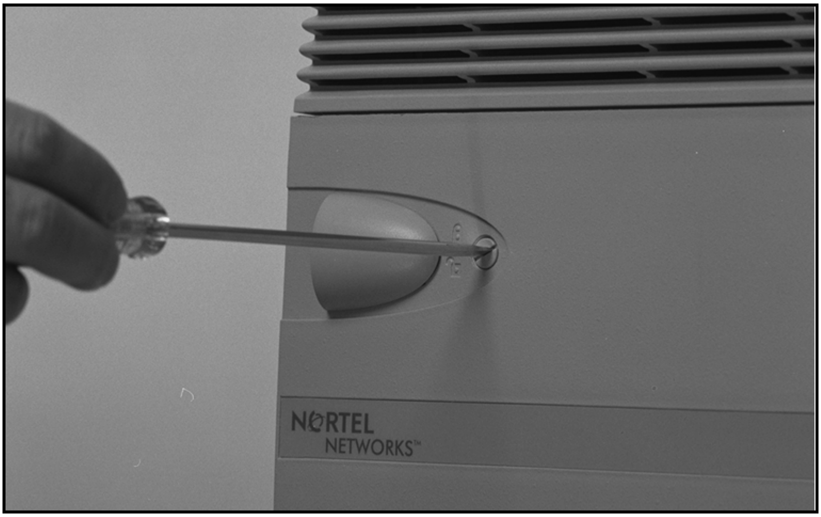
If the front cover lock latches are in their locked position, use a screwdriver and turn the lug on each latch 90° to the unlocked position (Refer to Figure 41 on page 118).

Simultaneously slide both latches in towards the center of the cabinet.

Grasp the sides of the cover and pull the top outwards, then lift it upward to remove it from the cabinet.

Note: The bottom of the front cover is supported but not secured to the cabinet. Be careful not to drop it.

Figure 41
Unlocking the latches



7 **Remove the metal drip tray.**

Check the wrist strap in the bottom right of the cabinet. It may have come loose during transit. If so, attach it to the velcro tab on the inside right wall of the cabinet.

WARNING

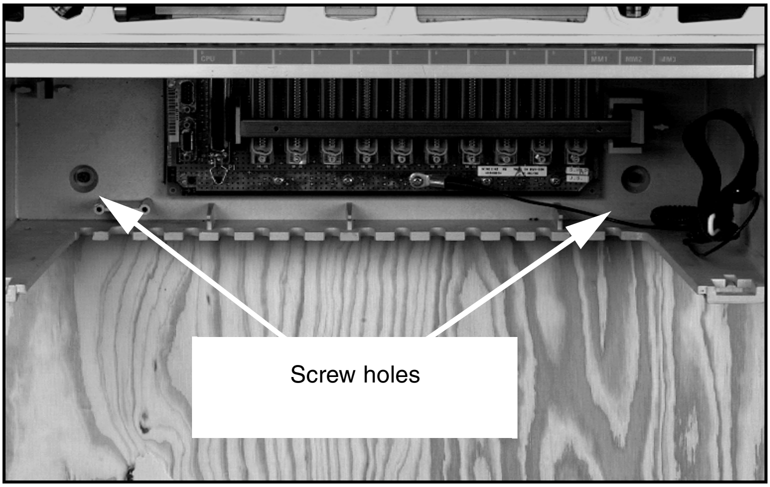
An empty cabinet weighs 25 lb (12 kg). Get help to lift the cabinet if necessary.

8 **Lift the cabinet and hang it on the mounting bracket hook.**

9 **Locate the two screw holes at the bottom towards the rear of the cabinet.** See Figure 42 on page 119**.**

10 **Adjust the cabinet so that it is straight and level. Fasten the bottom of the cabinet to the wall with the two 1 in. # 12 screws provided with the cabinet.**

Figure 42
Securing the cabinet to the wall



11 **If additional expansion cabinets are being installed at this site, repeat Steps 6 through 10 to install those cabinets.**

Mounting the cabinet on the floor

Items required

To mount the cabinet on the floor you need:

- the optional pedestal for floor mounting
- four #14 screws provided to secure the cabinet to the pedestal
- the equipment layout plan as developed on page 56.

Procedure 6
Floor mounting

WARNING
An empty cabinet weighs 25 lb (12 kg). Get help to lift the cabinet if necessary.

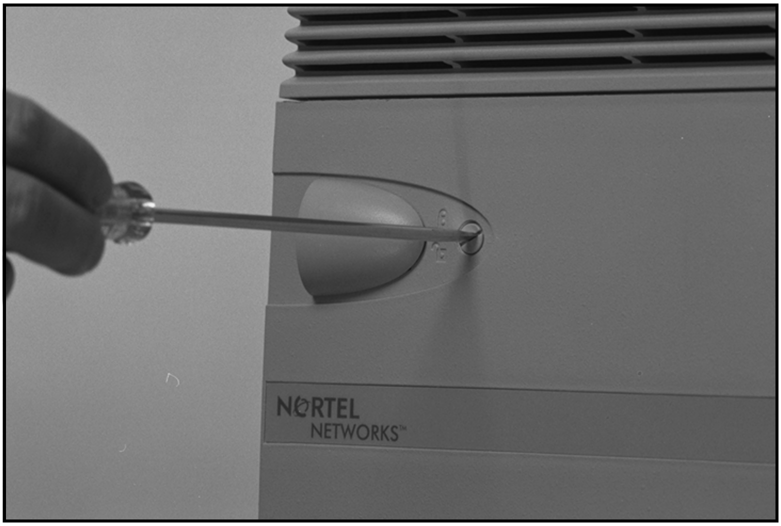
1 **Remove the main cabinet (or expansion cabinet if the main cabinet has been installed) from its carton and remove its front cover.**

If the front cover lock latches are in their locked position, use a screwdriver and turn the lug on each latch 90° to the unlocked position (Refer to Figure 43 on page 121).

Simultaneously slide both latches in towards the center of the cabinet.

Grasp the sides of the cover and pull the top outwards, then lift it upward to remove it from the cabinet.

Figure 43
Unlocking the latches



Note: The bottom of the front cover is supported but not secured to the cabinet. Be careful not to drop it.

2 **Remove the metal drip tray.**

Check the wrist strap in the bottom right of the cabinet. It may have come loose during transit. If so, attach it to the velcro tab on the inside right wall of the cabinet.

3 **Locate the carton containing the pedestal.**

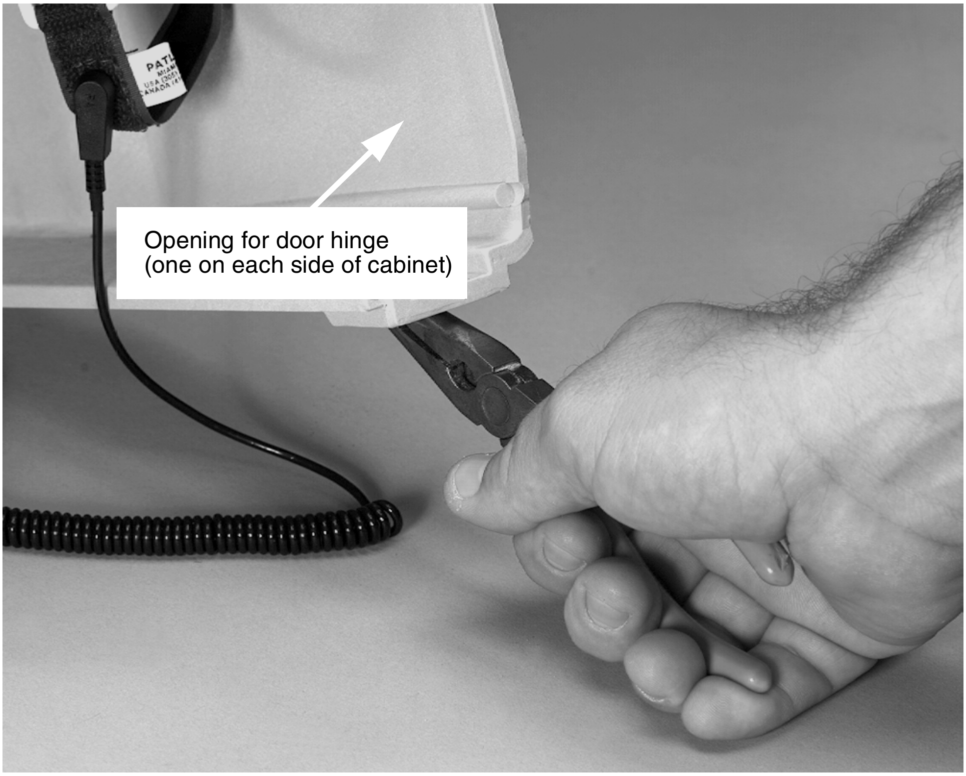
Remove the pedestal from the carton and locate the four leveling feet.

Install the feet into the base of the pedestal.

4 **Install the cabinet on the pedestal.**

Lean the cabinet backwards. From under the cabinet and with a pair of pliers, break off the two tabs located in the openings on the bottom of the cabinet where the door hinges join the cabinet as shown in Figure 44 on page 122.

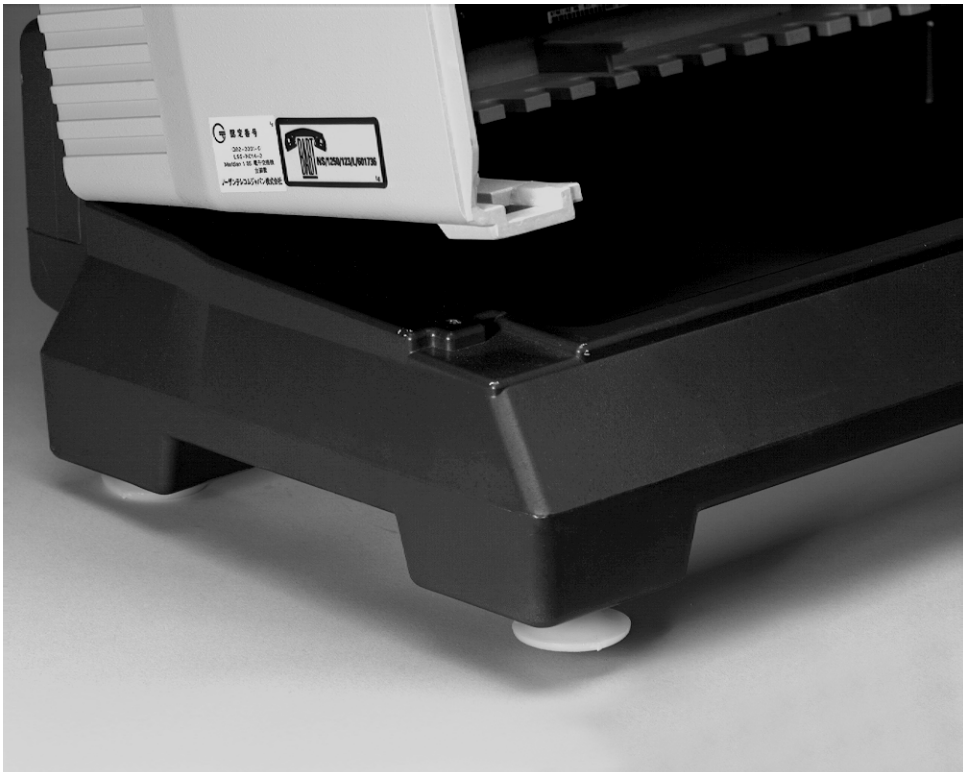
Figure 44
Installing the pedestal



Place the cabinet on the pedestal and make sure that it is properly seated. Align with the guide at the rear of the cabinet and pedestal (Refer to Figure 45 on page 123).

Install the four #14 screws that are shipped with the pedestal, two at the bottom rear and two where the tabs were removed, and secure the cabinet to the pedestal.Opening for door hinge (one on each side of cabinet)

Figure 45
Mounting the cabinet on the pedestal



5 **Position the cabinet according to the equipment layout plan.**

6 **If an additional expansion cabinet is being installed at this site, repeat this procedure for that cabinet.**

Installing the system ground

Contents

This section contains information on the following topics:

General information 125
Cabinets powered by the same service panel 126
Cabinets powered by different service panels 126
Grounding instructions for cabinets 126

General information

This chapter describes how to install and connect the ground source to the Option 11C cabinets. This chapter contains the following procedures:

- Procedure 7, “Grounding the cabinets” on page 126
- Procedure 8, “Earthing the cabinets (UK)” on page 130

Note: System ground is synonymous with system earth in the UK.

Make sure you read, “Grounding requirements” on page 39, before proceeding further.

> **WARNING**
>
> Proper grounding is extremely important.
> Failure to complete the following steps could result in a system that is:
>
> - unsafe for personnel using the equipment
> - not protected from lighting or power surges
> - subject to service interruptions.
>
> Insulated ground wire **must** be used for system grounding.

Cabinets powered by the same service panel

For each system cabinet in collocated multi-cabinet situations, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to an NTBK80 ground bar. The ground bar is in turn connected to a ground source (the ground bus in the AC service panel).

Cabinets powered by different service panels

For each system cabinet in collocated multi-cabinet situations, a #6 AWG (#40 Metric Wire Gauge) ground wire is connected from the cabinet to an NTBK80 ground bar. If any cabinet cannot be powered from the same service panel, it must be grounded separately from the others back to the service panel that supplies it.

Grounding instructions for cabinets

The following procedure describes how to ground Option 11C cabinets. Repeat the steps for each cabinet installed in the system.

Procedure 7
Grounding the cabinets

1 **If the cabinet is equipped with a power supply unit, make sure that the AC power cord is disconnected from the power outlet.**

WARNING

Power should never be connected to a cabinet that is not properly grounded.

2 **If the cabinet is connected to a reserve power supply unit (battery backup), make sure that the circuit breaker on that unit is set to OFF.**

WARNING

Backup power should never be connected to a cabinet that is not properly grounded.

3 **If not previously installed, install an NTBK80 ground bar near the cabinet.**

Note: The ground bar is intended to be used as a convenient bridging point for ground wires from up to three nearby Option 11C cabinets. Additional ground bars are required for remote cabinets, or when more than three cabinets are collocated.

4 **Install a #6 AWG (# 40 Metric Wire Gauge) ground wire from the ground lug in each cabinet to the NTBK80 ground bar (which is in turn connected with #6 AWG wire to the ground bus in the AC power service panel).**

Connect the ground wire to the ground lug located in the bottom of the cabinet next to the cable connectors (Refer to Figure 47 on page 129).

Route the ground wire through the third groove from the left in the bottom of the cabinet.

Connect the ground wire to the ground bar (Refer to Figure 46 on page 128).

Place a DO NOT DISCONNECT tag on the ground wire.

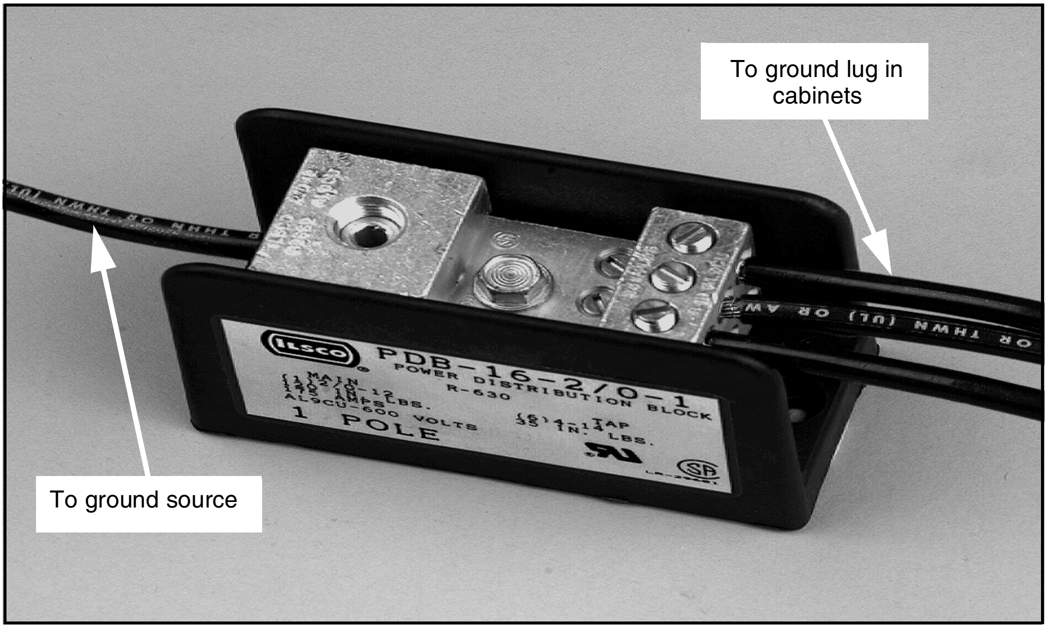
5. **Connect the grounding block to a suitable ground source (the ground bus in the AC power service panel).**

WARNING

The connection in the AC power service panel should be performed by a qualified technician or electrician.

6. **Place a DO NOT DISCONNECT tag on the ground wire at the service panel.**

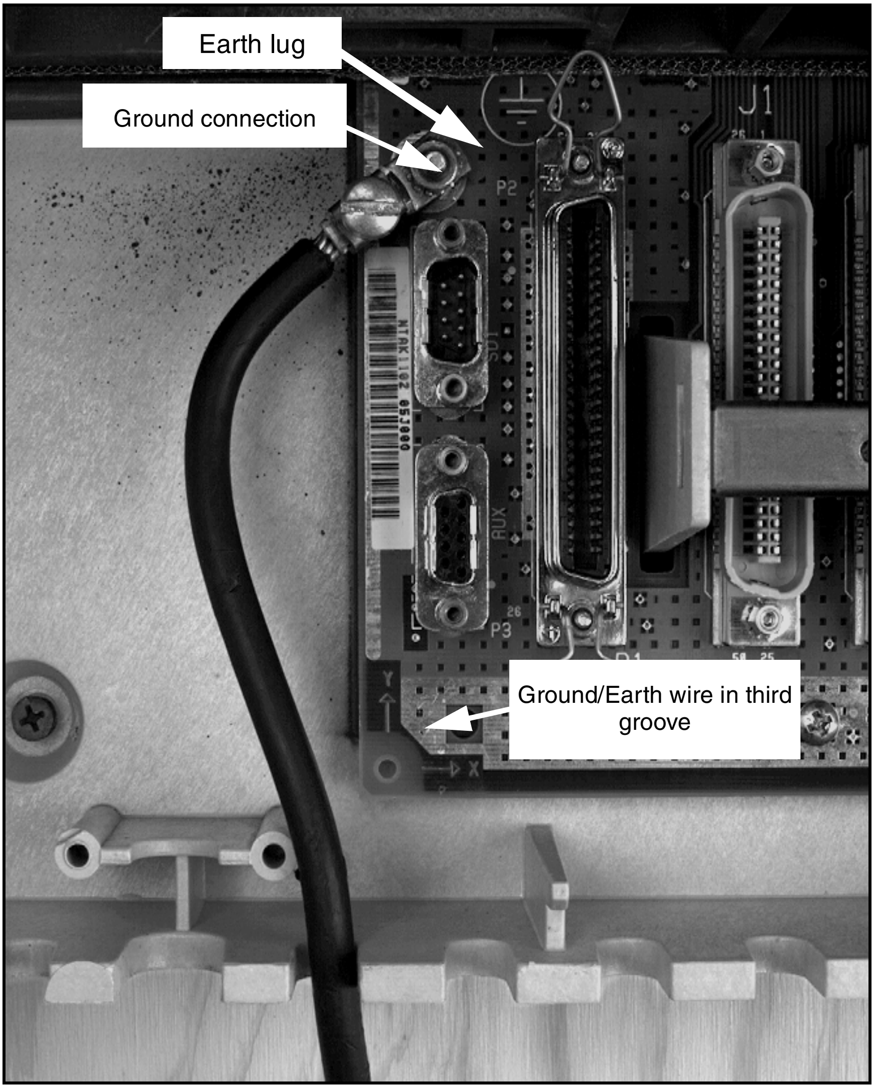
Figure 46
NTBK80 grounding block



To ground lug in cabinets

To ground source

Figure 47
Ground/Earth lug in the NTAK11 system cabinets


Earth lug
Ground connection
Ground/Earth wire in third groove
J1
P2
SDI
AUX
P3

Procedure 8
Earthing the cabinets (UK)

1 **Connect a protective and functional earth wire from the earthing strip on the test jack frame to the earth at the building entry point.**

Use a green/yellow wire no thinner than 10 mm^2.

2 **In each cabinet, connect an earth wire from the earth lug in the cabinet (see Figure 47 on page 129) to the earth connection at the Test Jack Frame.**

Use a green/yellow wire no thinner than 10 mm^2. Route the earth wire through the third groove from the left in the bottom of the cabinet. Place a DO NOT DISCONNECT tag on the earthing wire.

3 **Measure the resistance of the earth between the test jack frame and the main cabinet frame earth.**

The resistance should be no more than 0.25¾ at 30 amperes.

Installing the power supplies

Contents

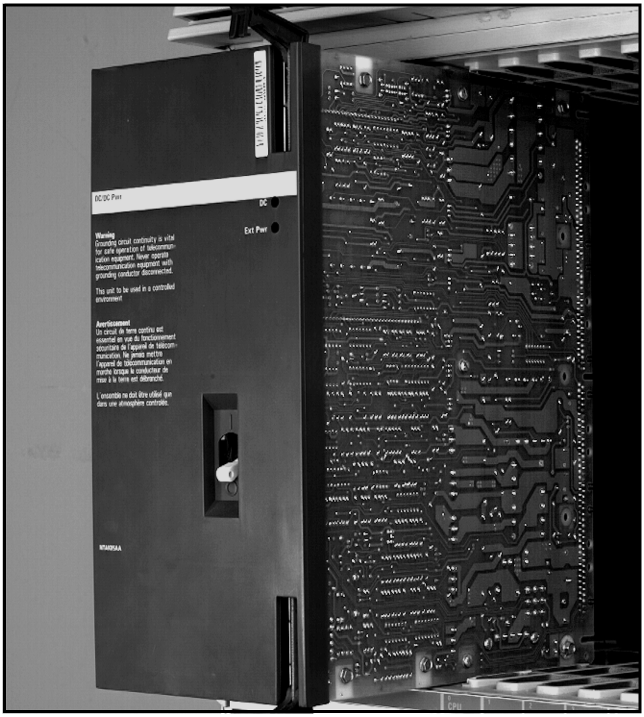
This section contains information on the following topics:

General information 131
Power supplies 132
AC- powered system 132
DC-powered system 132
Switch settings 133
AC power supply installation 134
DC power supply installation 136

General information

This chapter describes how and where to install the power supplies used in the Option 11C system.

Figure 48
Power supply location — main and expansion cabinets


DC/DC Pwr
DC
Ext Pwr
Warning
Grounding circuit continuity is vital for safe operation of telecommunication equipment. Never operate telecommunication equipment with grounding conductor disconnected.
This unit to be used in a controlled environment
Avertissement
Un circuit de terre continu est essentiel en vue du fonctionnement sécuritaire de l'appareil de télécommunication. Ne jamais mettre l'appareil de télécommunication en marche lorsque le conducteur de mise à la terre est débranché.
L'ensemble ne doit être utilisé que dans une atmosphère contrôlée.
NTAK05AA

Power supplies

Power supplies are shipped separately from the cabinets.

AC- powered system

If installing an AC-powered system, an NTAK04 or NTDK78 ac/dc power supply is required with its appropriate line cord for each cabinet.

DC-powered system

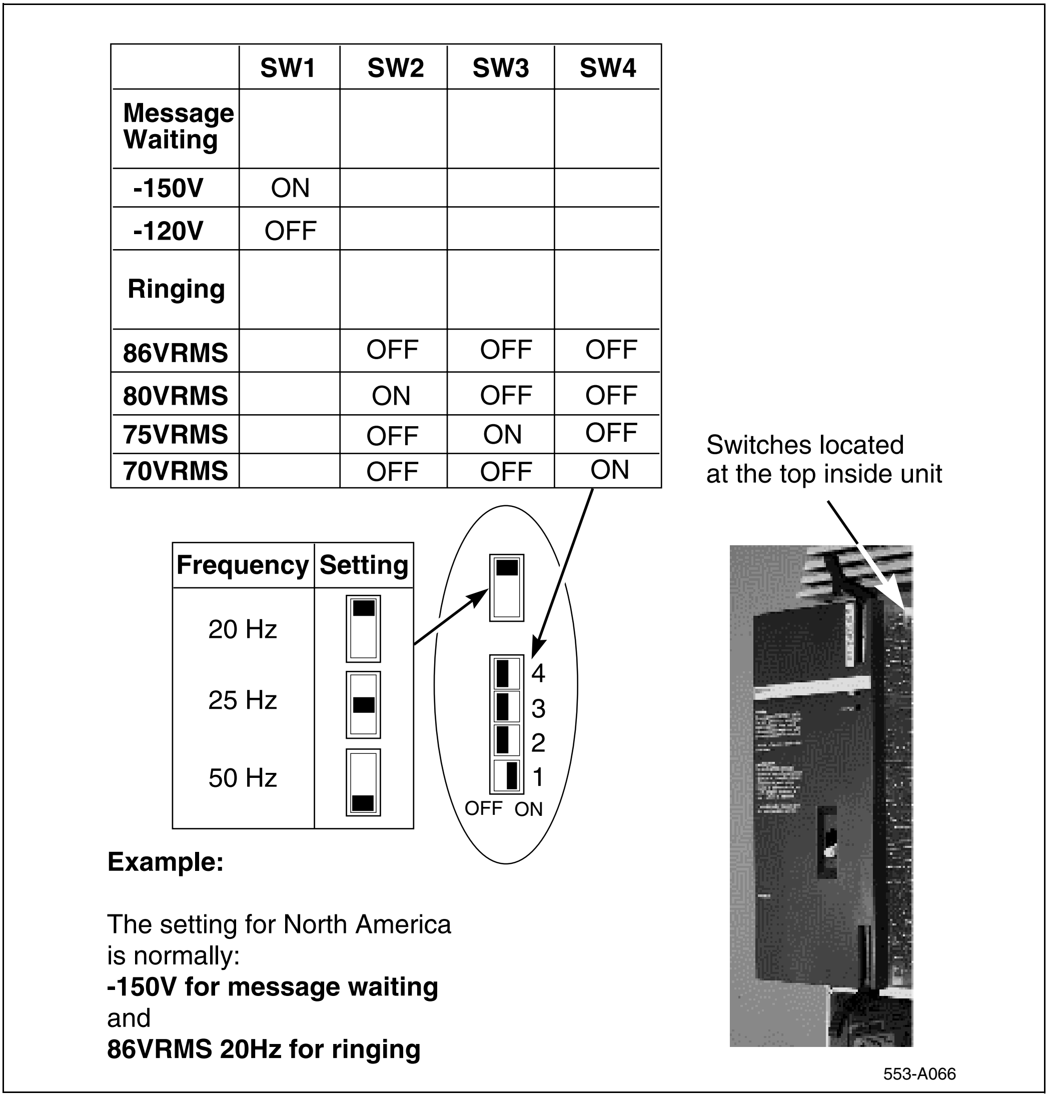
If installing a DC-powered system, an NTAK05 or NTDK72 DC power supply is required for each cabinet.

- Additionally, one NTAK0420 power cable is required for each cabinet (for a DC power source).

Switch settings

The power supplies are equipped with a series of switches which must be set before the units are installed in the cabinet. Refer to Figure 49 on page 133.

Figure 49
NTAK04, NTAK05, NTDK72 and NTDK78 power supply switch settings



	SW1	SW2	SW3	SW4
Message Waiting				
-150V	ON			
-120V	OFF			
Ringing				
86VRMS		OFF	OFF	OFF
80VRMS		ON	OFF	OFF
75VRMS		OFF	ON	OFF
70VRMS		OFF	OFF	ON

Frequency	Setting
20 Hz	▀
25 Hz	■
50 Hz	▄

Example:

The setting for North America is normally:
-150V for message waiting
and
86VRMS 20Hz for ringing

AC power supply installation

AC power requirements

The AC-powered version requires a non-switched dedicated power outlet installed within 6 ft (1830 mm) of each cabinet, with:

- one non-switched dedicated outlet per cabinet with:
  - Voltage: Recommended 100 to 240 volts
    Maximum limits 90 and 250 volts
    Single phase
  - Frequency: 50 or 60 Hz
  - Power (I/P Max): 750VA

Refer to “Commercial power requirements” on page 43 for detailed information about power requirements.

WARNING

Wait at least five minutes after power to the unit is switched off before removing the unit from the cabinet. Make sure that the power cord and battery backup connection (if equipped) are both disconnected.

CAUTION

The NTAK04 or NTDK78 ac/dc power supply cannot power up on battery alone. If the NTAK04 or NTDK78 is powered down while operating on DC reserve power, then AC power is required to power up.

Procedure 9
Installing the AC power supply

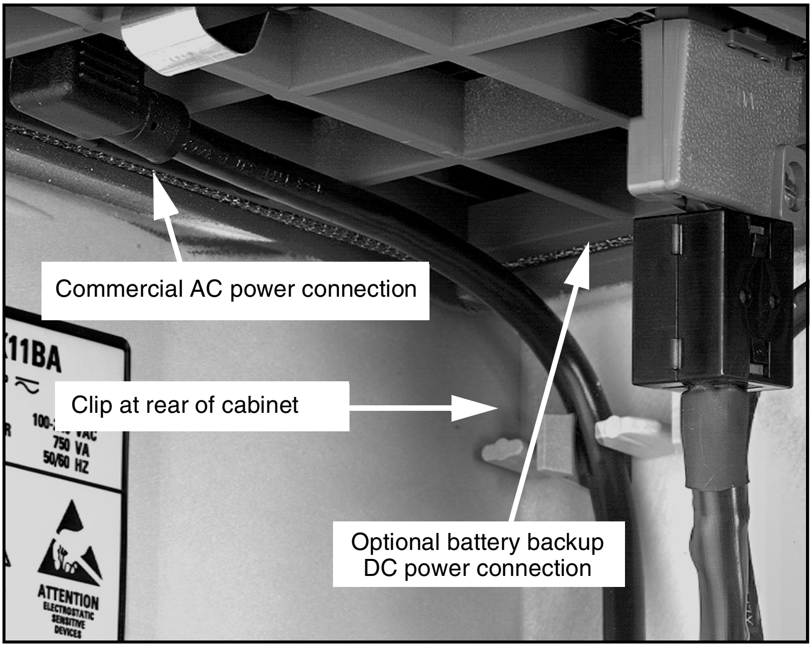
1. **Set the AC breaker on the front of the power supply to the OFF position.**
2. **Make sure that the switches on the power supply are properly set.** See Figure 49 on page 133.

3 **Insert the power supply into the first slot on the left of the card shelf (refer to Figure 48 on page 132).**

4 **Lock it into place with the card tabs.**

5 **Attach the power line cord to the connector on the left side of the power supply (see Figure 50 on page 135) by feeding the cord up through the card guides.**

Figure 50
AC power cable connection


Commercial AC power connection
Clip at rear of cabinet
Optional battery backup DC power connection
11BA
750 VA
50/60 HZ
ATTENTION
ELECTROSTATIC
SENSITIVE
DEVICES

6 **Secure the power line cord in place using the clip at rear of cabinet.** See Figure 50 on page 135**.**

7 **Route the rest of the power line cord down through the opening at the bottom of the cabinet.**

8 **Test the ground of each system cabinet using the following:**

a) Set the circuit breakers feeding the AC outlet used to power the cabinet to OFF.

b) Connect the power line cord to the NTAK04 or NTDK78 main cabinet power supply.

c) Using an ohmmeter, measure the resistance from the ground pin on the line cord to the ground receptacle on the AC outlet.

The resistance must be less than 0.25 Ohms.
If the cabinets are powered from different service panels, the ground must be traced back to the panel serving the cabinet.

d) Reset the circuit breaker once the ground connection is verified.

DC power supply installation

Table 15
DC power requirements

	Minimum (see note)	Nominal	Maximum
Recommended	-42.5 V dc	-52 V dc	-54 V dc
Limits	-42.5 V dc	-52 V dc	-57 V dc
Noise (CMESS)	—	—	25 dBrnc
Current	—	—	12 Amps
AC Ripple	—	—	100 mv RMS

Note: The NTAK05 or NTDK72 DC breaker will trip at -42.5 +/- 1.0Vdc.

Refer to the “DC-powered version” on page 51 for detailed information about DC power requirements.

Procedure 10
Installing the DC power supply

1 **Make sure the switches on the power supply are properly set. Refer to Figure 49 on page 133 of this chapter.**

2 **Insert the power supply into the first slot on the left of the card shelf (refer to Figure 48 on page 132).**

CAUTION

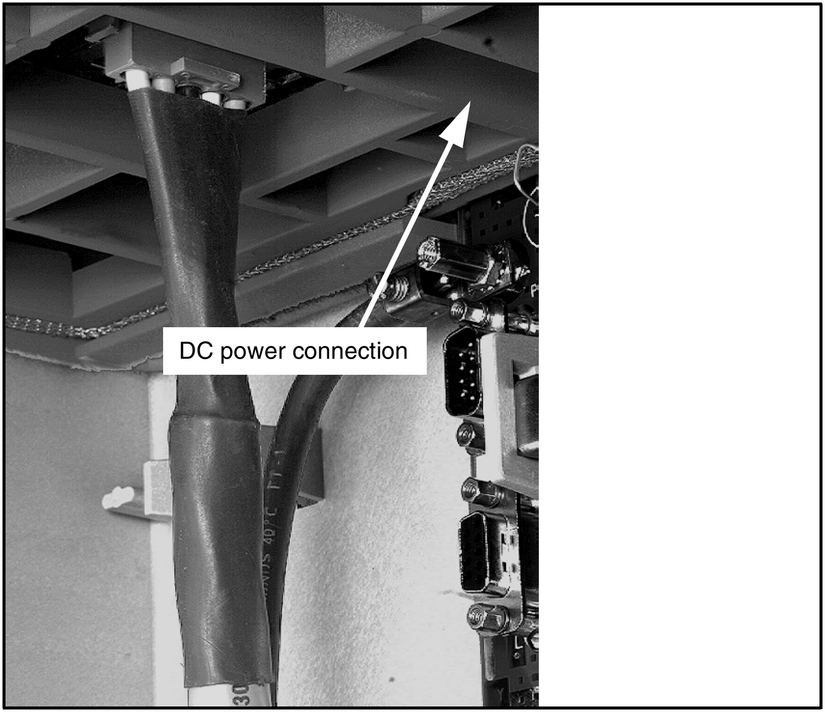
Make sure the circuit breaker on the faceplate of the power supply is OFF before continuing.

3 **Lock the power supply into place with the card tabs.**

4 **If a rectifier is to be installed with the system, install it using the instructions supplied with the rectifier.**

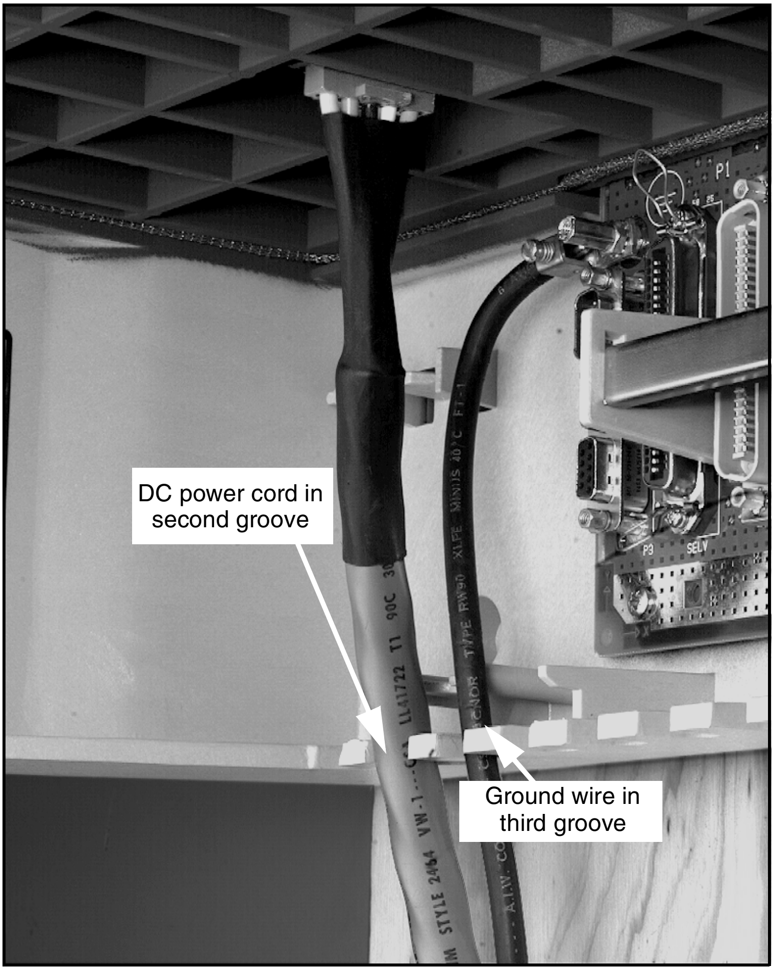
5 **Feed one end of the DC power cable up through the card guide and insert it into the connector on the right side of the DC power supply. See Figure 51 on page 138.**

Figure 51
NTAK05 or NTDK72 DC power cable connection



6 **Route the rest of the power cable down through the opening at the bottom of the cabinet as shown in Figure 52 on page 139.**

Figure 52
Power cord routing

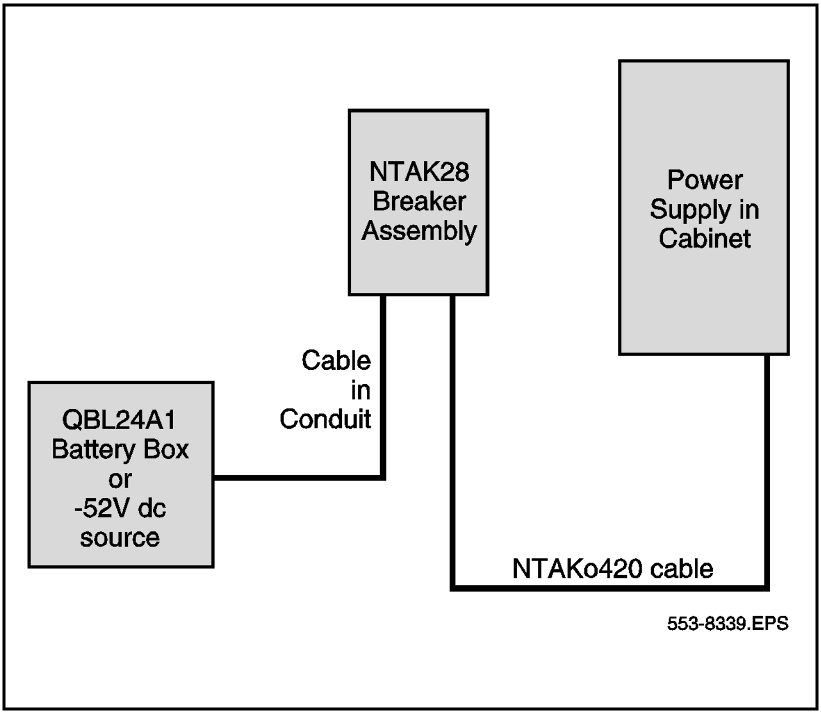

DC power cord in second groove
Ground wire in third groove

7 **Mount the NTAK28 Breaker Assembly to the wall within 3 ft (915 mm) of the cabinet it is serving. See Figure 53 on page 140.**

Secure the breaker assembly with four #10 1/2 in. (15 mm minimum) wood screws.

Note: One NTAK28 Breaker Assembly is required for each cabinet.

Figure 53
NTAK28 Breaker Assembly location

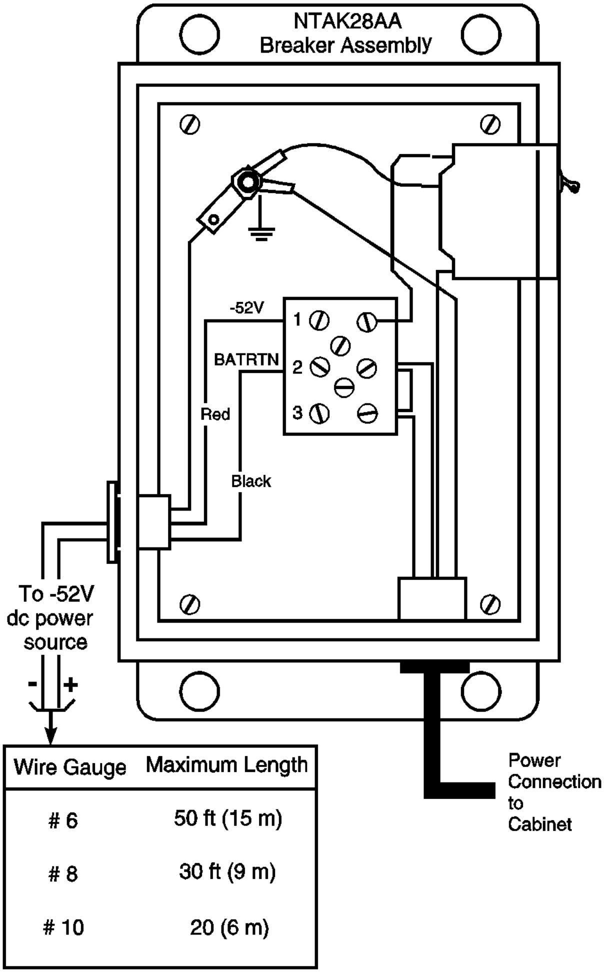

NTAK28
Breaker
Assembly
Power
Supply in
Cabinet
Cable
in
Conduit
QBL24A1
Battery Box
or
-52V dc
source
NTAKo420 cable
553-8339.EPS

8 **Set the breakers on the NTAK28 Breaker Assembly and on the NTAK05 or NTDK72 power supply to OFF.**

9 **Connect the other end of the DC power cable (NTAK0420 cable) to the connector on the DC breaker assembly.**

10 **Connect the NTAK28 Breaker Assembly to a rectifier or other DC power source as shown in Figure 54 on page 141.**

Figure 54
Power connection at the NTAK28 breaker assembly


NTAK28AA
Breaker Assembly
-52V
BATRTN
Red
Black
1
2
3
To -52V
dc power
source
-
+
Power
Connection
to
Cabinet
553-8340.EPS

Wire Gauge	Maximum Length
# 6	50 ft (15 m)
# 8	30 ft (9 m)
# 10	20 (6 m)

Installing System Controller Cards

Contents

This section contains information on the following topics:

General information 143
Main Cabinet NTDK20 SSC installation 143
Software Daughterboard and Security Device installation 144
Installation of expansion daughterboards and cables 146
NTDK20 SSC installation on IP Expansion cabinets 164
Software Daughterboard and Security Device 164
IP Expansion Daughterboards 165
Expansion Cabinet Fiber Receiver Card 166

General information

This chapter describes how and where to install the controller cards required in the Option 11C system. It includes information relevant to the main cabinet, IP expansion cabinets and Fiber expansion cabinets.

Main Cabinet NTDK20 SSC installation

This section describes the steps to install an SSC card in an Option 11C Main cabinet. It also describes the installation of the daughterboards, cables and other components that are required installation on the main cabinet SSC card.

Software Daughterboard and Security Device installation

CAUTION

The NDK20EA SSC card is equipped with components on both sides of the circuit board. Be careful not to damage any of the components when handling the card.

Procedure 11
Installing the Software Daughterboard and Security Device

1 **Put on the anti-static wrist strap.**

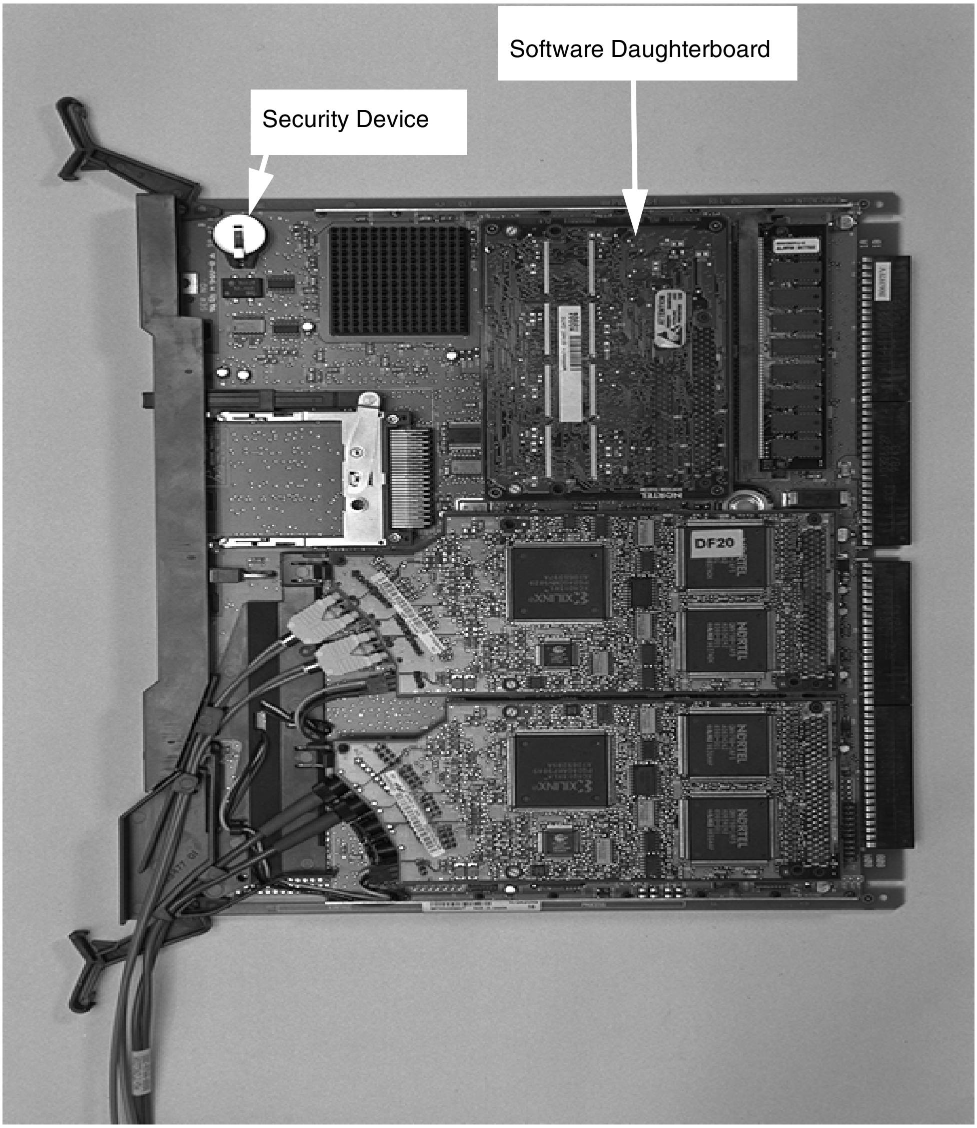
2 **Place the SSC card on a clean flat surface.**

3 **Install the Software Daughterboard on the connector as shown in Figure 55 on page 145.**

4 **Press firmly on the standoffs to ensure that the daughterboard is secured well to the SSC card.**

5 **Insert the Security Device labeled NT_STD in the socket with the device markings facing outwards, as shown in Figure 55 on page 145.**

Figure 55
Location of Software Daughterboard and Security Device on the NTDK20 SSC card


Software Daughterboard
Security Device
DF20

Installation of expansion daughterboards and cables

The following four daughterboards can be installed on the SSC card in the main Option 11C cabinet:

- NTDK22/24/81(Single mode) - single port
- NTDK84/85 - dual port
- NTDK83/99 100BaseT IP - dual/single port
- NTTK02/01 100BaseF IP- dual/single port

Two ports are available allowing a maximum of two (single or dual) daughterboards per Main SSC card.

On the SSC card of an IP expansion cabinet, an IP daughterboard must be installed.

WARNING

The fiber optic interface product used in Option 11C is considered safe. However, as a precaution do not view the optical port or the end of fiber optic cable. Under certain conditions (such as during cable testing or under light magnification) the cable or port may expose the eye beyond the limits of Maximum Permissible Exposure recommended in some jurisdictions. Do not remove protective caps or plugs until ready to connect the cable.

Installation of IP expansion daughterboards and cables on the main cabinet

Note: The cables must be installed and connected before mounting the daughterboard on the SSC

Procedure 12
Installing the 100BaseT daughterboards on the SSC card

1. **Put on the anti-static wrist strap.**
2. **Place the SSC card on a clean flat surface.**
3. **Replace the standoffs on the SSC card with the taller standoffs supplied with the IP daughterboard.**

4 **Record the MAC address found on the back of the daughterboard. This will be needed later to perform the software installation. See Figure 57 on page 149.**

5 **Insert the male end on the NTDK8305 cable into one port on the IP daughterboard. Pull gently on the cable to make sure the connection is secure.**

Note: The top connector on the SSC card is for expansion cabinets”1” and “3”. The lower connector is for expansion cabinets “2” and “4”.

6 **Connect the LED cable to receptacle on daughterboard**. See Figure 57 on page 149 for exact location.

7 **Mount daughterboard onto card by inserting the plastic post into designated slot on the daughterboard.** See Figure 57 on page 149 for exact positioning.

Note: Tip daughterboard down over the post and press down onto the two standoffs.

8 **Firmly press daughterboard down on connector pin to secure in place.**

9 **Route expansion cable through the cable router on the SSC card.**

10 **Install EMC Grounding Clip on the cabinet’s stiffener rail**. See Figure 58 on page 150 for exact positioning.

Note: Depending on the vintage of the cabinet, this clip may already be installed. In this case, loosen the screws that secure it to the stiffener rail and rotate the clip to an outward position.

CAUTION

The EMC grounding clip must be used to secure the contact between the cable and the metal stiffener rail. Failure to do so will compromise EMC compliance.

11 **Insert the SSC card into slot ‘0’ of the Main Option 11C cabinet. Lock card into face plate latches.**

12 **Route NTDK8305 extension cable through EMC clip. Push cable to the left as shown in Figure 58 on page 150.**

13 **Route cable through cable routing guide to secure cable and tidy the installation.**

Note: Be sure to wrap the cable a **minimum** of one complete loop around the Cable Routing Guide.

Figure 56
NTDK83 dual port 100BaseT daughterboard

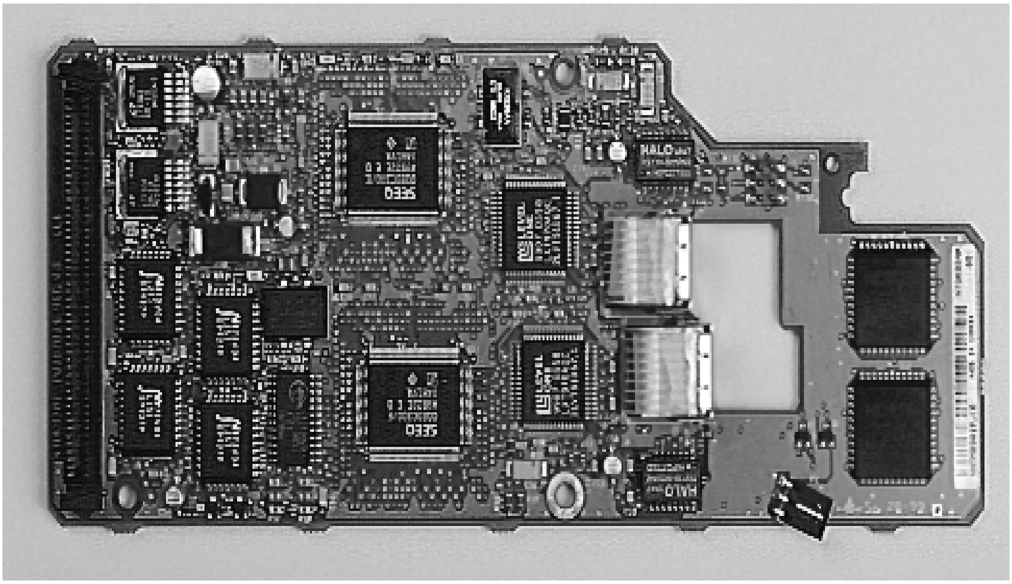


Figure 57
SSC card with 100BaseT daughterboard installed

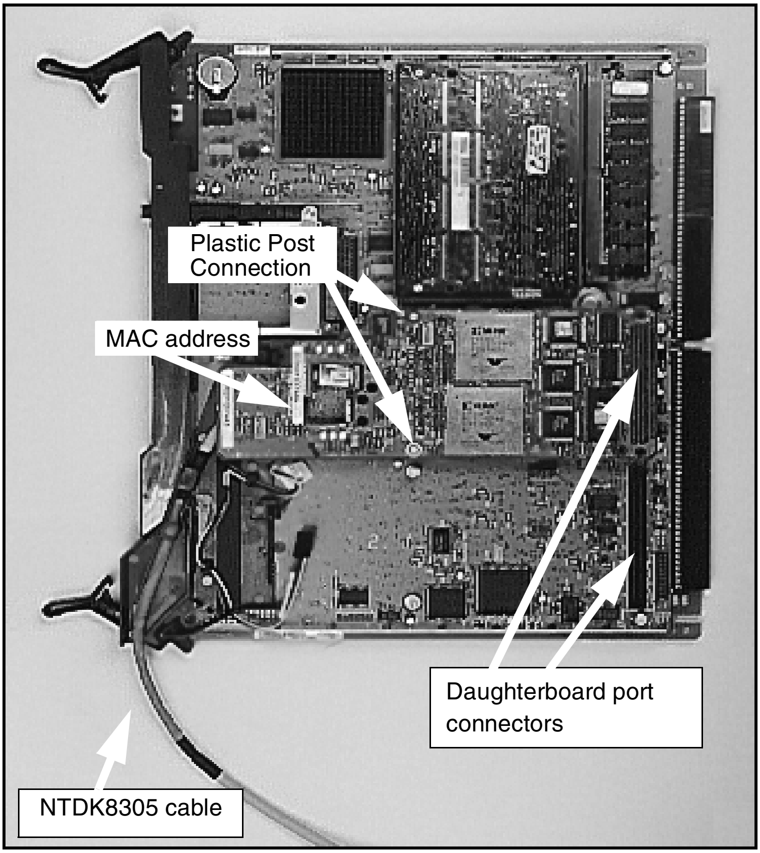
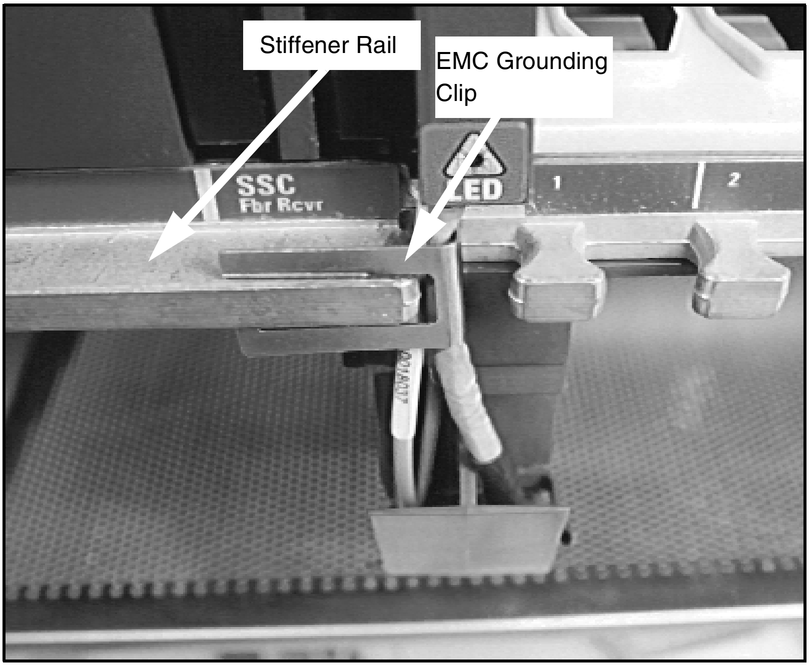

Plastic Post Connection
MAC address
Daughterboard port connectors
NTDK8305 cable

Figure 58
EMC Grounding Clip

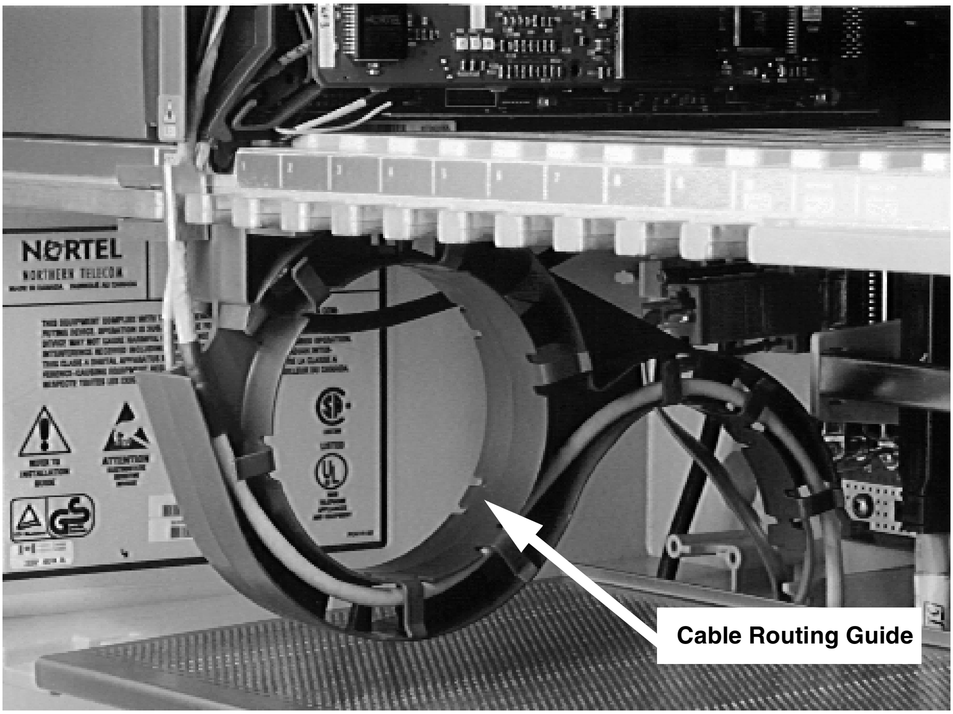

Stiffener Rail
EMC Grounding Clip
SSC
Fbr Rcvr
LED
1
2

Note 1: The EMC grounding clip is installed on the front of the stiffener rail on the Option 11C IP cabinet. There is a small #4-40 screw to fasten the clip to the stiffener rail. The 100BaseT cable is then fed through and secured in the clip.

IMPORTANT

The grounding clip is required to ensure EMC compliance.

Figure 59
Cable Routing Guide under Main Option 11C cabinet



Procedure 13
Installing the 100BaseF IP daughterboard on the SSC card on the Main Cabinet

1 **Put on the anti-static wrist strap.**

2 **Place the SSC card on a clean flat surface.**

3 **Remove protective plugs from the connectors on the daughterboard.**

4 **Insert the A0817052 MT-RJ to ST cable end into the daughterboard connector.** See Figure 61 on page 154 for identification of cable ends.

Repeat step 4 if a second fiber connection is required.

Note 1: With new connectors, push very firmly until a definite ‘click’ is heard. Pull gently on the connection to make sure it is secure.

Note 2: The top connector on the SSC card is for expansion cabinets”1” and “3”. The lower connector is for expansion cabinets “2” and “4”.

5 **Replace the standoffs on the SSC card with the standoffs supplied with the IP daughterboard.**

6 **Record the MAC address found on the back of the daughterboard of the expansion cabinets.** This will be needed later to perform the software installation.

7 **Connect the faceplate LED to the 3 pin receptacle on daughterboard** See Figure 60 on page 153 for exact location.

8 **Mount the daughterboard onto card by inserting the plastic post into designated slot on the daughterboard.** See Figure 57 on page 149 for exact positioning.

Note: Tip the daughterboard down over the post and press down onto the two standoffs.

9 **Firmly press the daughterboard down on connector pin to secure in place.**

10 **Route expansion cable through the cable router on the SSC card.**

11 **Insert the SSC card into slot “0” of the Main Option 11C cabinet. Lock card into face plate latches.**

12 **Route the cable through the Cable Routing Guide under the Main cabinet.**

Note: Be sure to wrap the cable a **minimum** of one complete loop around the Cable Routing Guide.

——————————— *End of Procedure* ———————————

Note: The use of the EMC clip is required for 100BaseT and is optional on 100BaseF connections.

Figure 60
NTTK02 dual port 100BaseF daughterboard

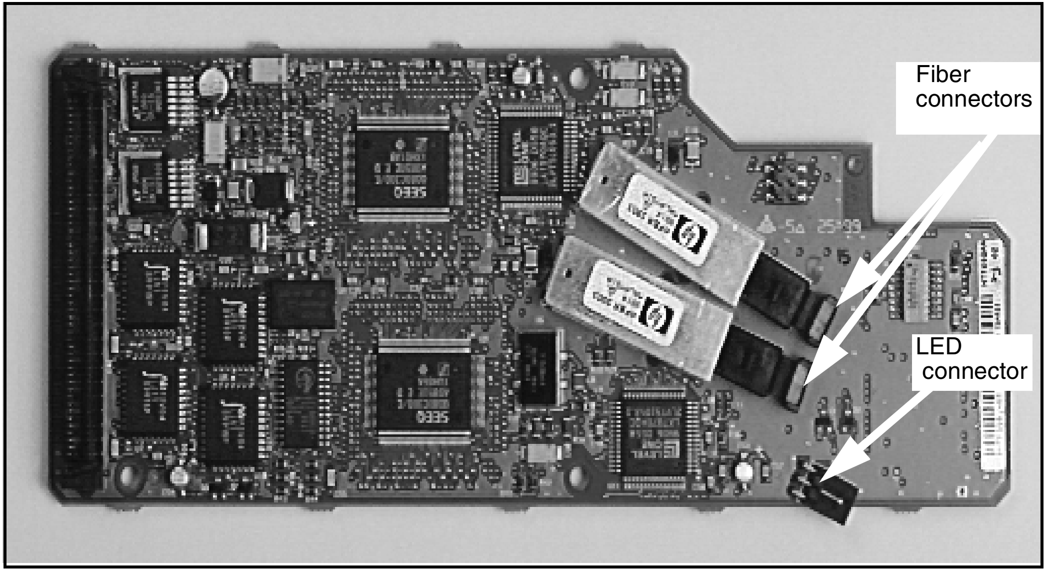
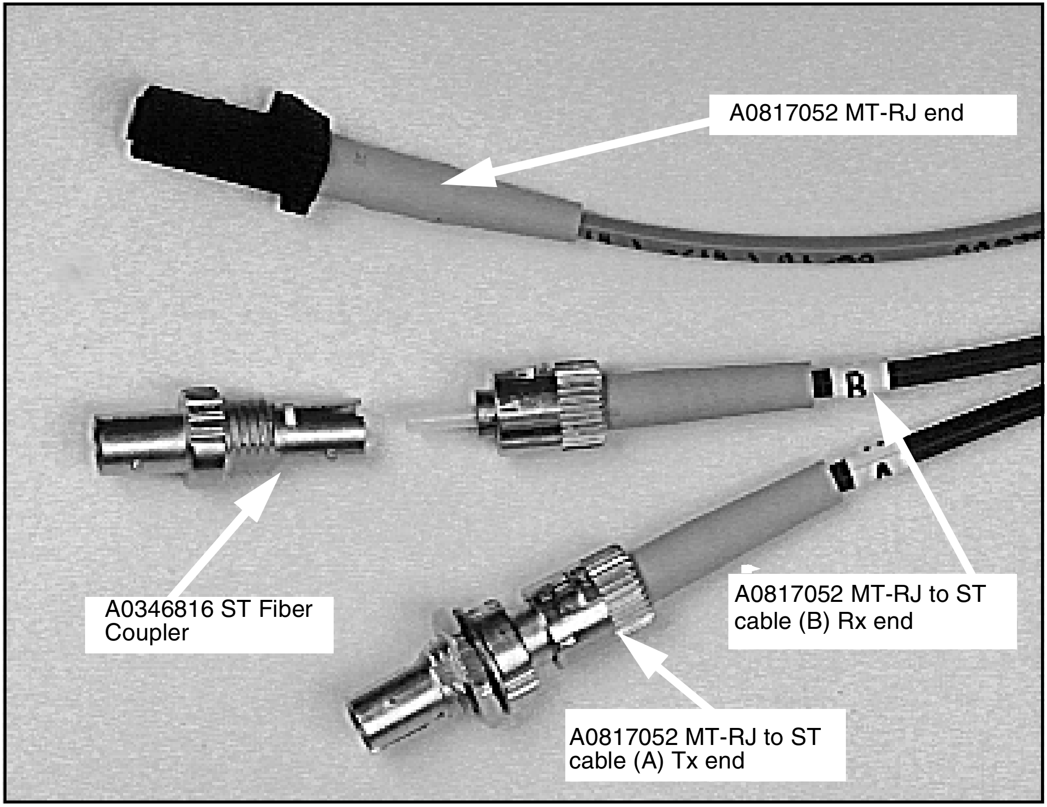

Fiber connectors
LED connector

Figure 61
Cable ends and fiber coupler


A0817052 MT-RJ end
A0346816 ST Fiber Coupler
A0817052 MT-RJ to ST cable (B) Rx end
A0817052 MT-RJ to ST cable (A) Tx end
B
A

Installation of Fiber Expansion daughterboards and cables

Procedure 14
Installing the Single Port Fiber Expansion daughterboards on the SSC card.

1. **Put on the anti-static wrist strap.**
2. **Place the SSC card on a clean flat surface.**
3. **Install the Fiber Daughterboard for expansion cabinet 1 on the upper connector.**
4. **Install the Fiber Daughterboard for expansion cabinet 2 on the lower connector.**

Note 1: If using the plastic fiber cable, see Procedure 16 on page 159

Note 2: If using glass fiber optic cable, see Procedure 17 on page 162.

5 **Press firmly on the standoffs to ensure that the daughterboards are secured to the SSC card.**

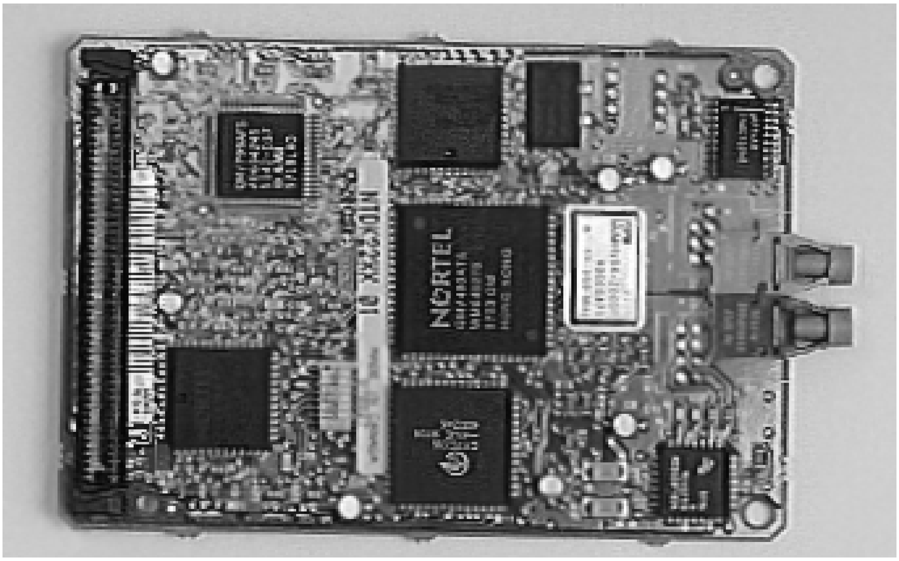
6 **Route the fiber cable through the cable routing guide on the SSC card.**

7 **Insert the NDK20EA SSC card into slot “0” of the main Option 11C cabinet.**

8 **Route the fiber cable through the Cable Routing Guide under the main cabinet.**

Note: Be sure to wrap the cable a **minimum** of one complete loop around the Cable Routing Guide to allow extra cable for removing the SSC card later.

Figure 62
NTDK22 Single Port Fiber Expansion Daughterboard



Procedure 15
Installing the Dual Port Fiber Expansion daughterboards on the SSC card.

1. **Put on the anti-static wrist strap.**
2. **Place the SSC card on a clean flat surface.**
3. **Install the Fiber Daughterboards for expansion cabinet 1 and 3 on the connector as shown in Figure 65 on page 158 (the upper connector).**
4. **Install the Fiber Daughterboard for expansion cabinet 2 and 4 on the connector as shown in Figure 65 on page 158 (the lower connector).**
5. **Connect the faceplate LED to the 3 pin header on the daughterboard. See Figure 65 on page 158.**
6. **Press firmly on the standoffs to ensure that the cards are secured to the SSC.**
7. **Route the cables through the SSC cable router on the SSC card. Refer to Figure 67 on page 161.**
8. **Insert the NDK20 SSC card into slot “0” of the main Option 11C cabinet.**
9. **Route the fiber cable through the Cable Routing Guide under the main cabinet.**

   Note: Be sure to wrap the cable a **minimum** of one complete loop around the Cable Routing Guide to allow extra cable for removing the SSC card later.

Figure 63
NTDK84 Dual Port Fiber Expansion Daughterboard (10 m)

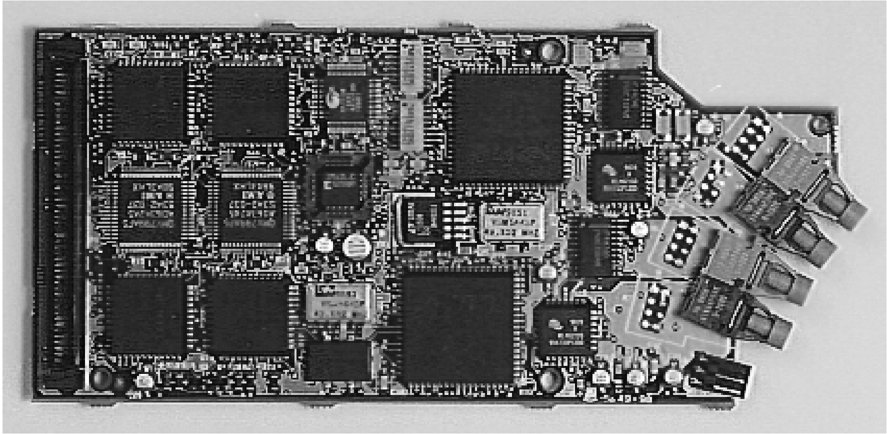


Figure 64
NTDK85 Dual Port Fiber Expansion Daughterboard (3 km)

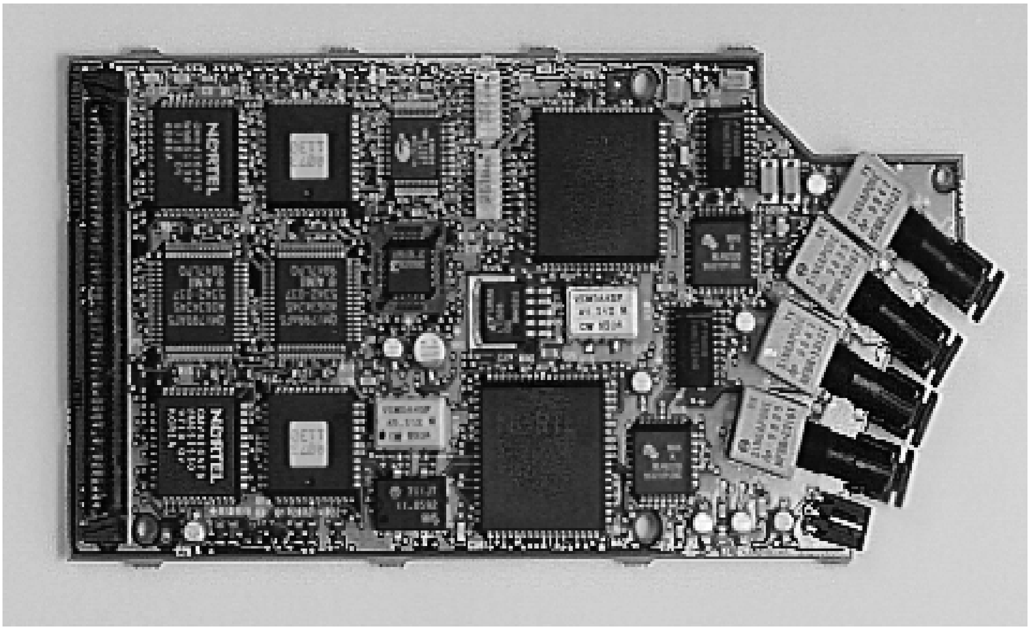
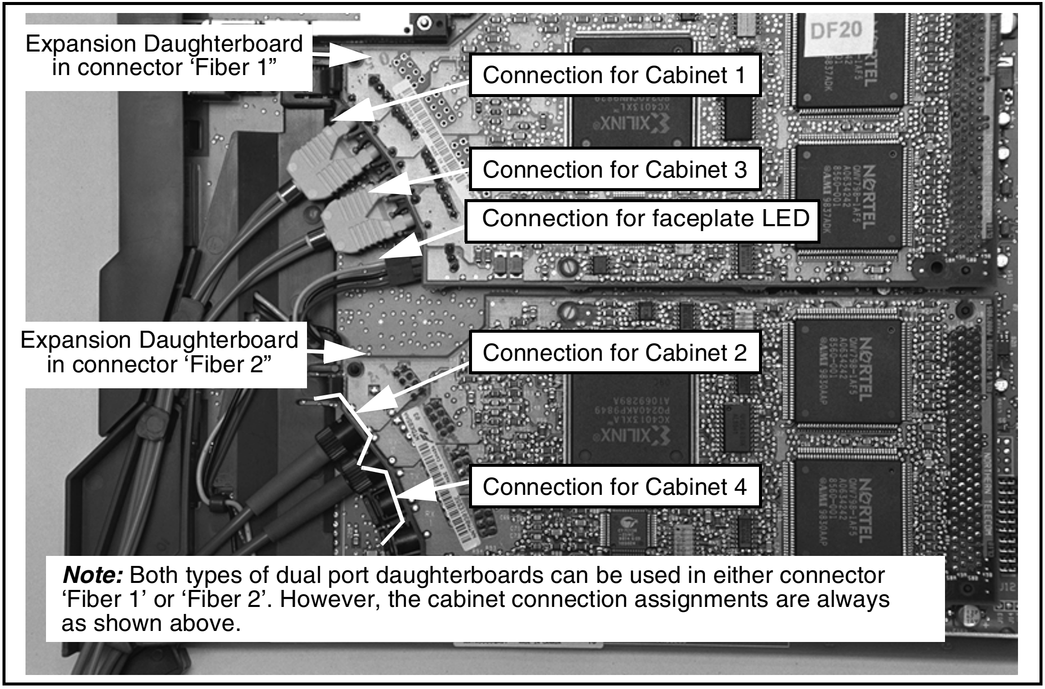


Figure 65
Cabinet assignments for both types of Dual Port Daughterboards


Expansion Daughterboard in connector 'Fiber 1"
Connection for Cabinet 1
Connection for Cabinet 3
Connection for faceplate LED
Expansion Daughterboard in connector 'Fiber 2"
Connection for Cabinet 2
Connection for Cabinet 4

Note: Both types of dual port daughterboards can be used in either connector 'Fiber 1' or 'Fiber 2'. However, the cabinet connection assignments are always as shown above.

Installing Fiber Daughterboard Cables

An A0632902 10 m plastic fiber optic cable is used to connect the main cabinet to an expansion cabinet located within 10 m (33 ft) when using short-haul fiber daughterboards.

A glass fiber optic cable, supplied and installed by a local facilities provider, can be used to connect an expansion cabinet located up to 3 km (1.8 mi.) from the main cabinet when using long-haul fiber daughterboards.

Do not staple or twist fiber optic cable. **Do not bend** it beyond a minimum 35 mm bend radius (90° soft bend).

CAUTION

Incorrectly connected fiber optic cables may cause the following problems:

– a series of repetitive fault indicating messages

– a complete failure of the expansion cabinet.

If fault indicating messages appear, check the fiber optic cable connections.

Since messages are stored in a buffer, they may continue to be displayed until the buffer is empty. After checking the cable connections, wait a couple of minutes for the messages to stop.

Procedure 16
Installing the A0632902 10m plastic fiber optic cable:

1 **Put on the anti-static wrist strap.**

2 **Place the SSC card on a clean flat surface.**

3 **Remove the protective plugs from the connectors on the Fiber Daughterboard.**

4 **Connect the fiber optic cable to the Fiber Daughterboard making sure that the 'V' shaped groove on the cable connector is facing outward and that the connector is fully seated.** See Figure 66 on page 160.

The mark (if equipped) on the sides of the cable connector should not be visible when properly connected. Refer to Figure 68 on page 162.

5 **Route the fiber cable through the SSC cable router on the SSC card.**

6 **Insert the SSC card into slot "0" of the main Option 11C cabinet. Lock card into face plate latches.**

7 **Route the cables through the SSC cable routing guide as shown in Figure 67 on page 161.**

Note: Be sure to wrap the cable a **minimum** of one complete loop around the cable routing guide to allow for extra cable for removing the SSC card later.

Figure 66
Plastic fiber optic connection on Fiber Receiver card

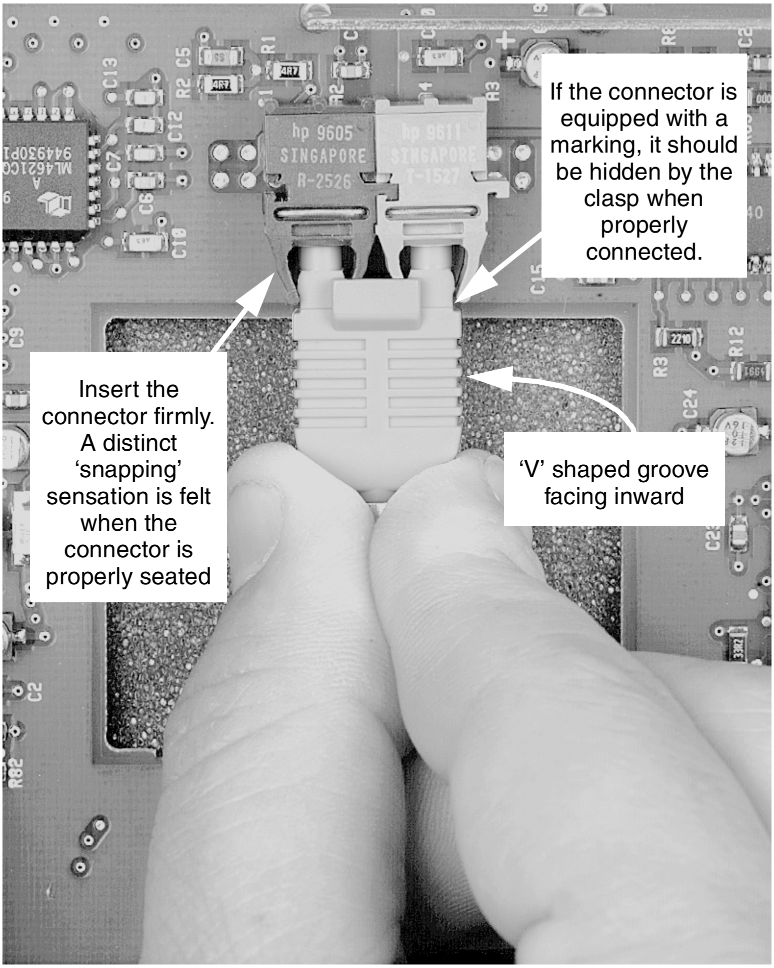

hp 9605
SINGAPORE
R-2526
hp 9611
SINGAPORE
T-1527
If the connector is equipped with a marking, it should be hidden by the clasp when properly connected.
Insert the connector firmly. A distinct 'snapping' sensation is felt when the connector is properly seated
'V' shaped groove facing inward

Figure 67
Fiber Optic Cable Connection

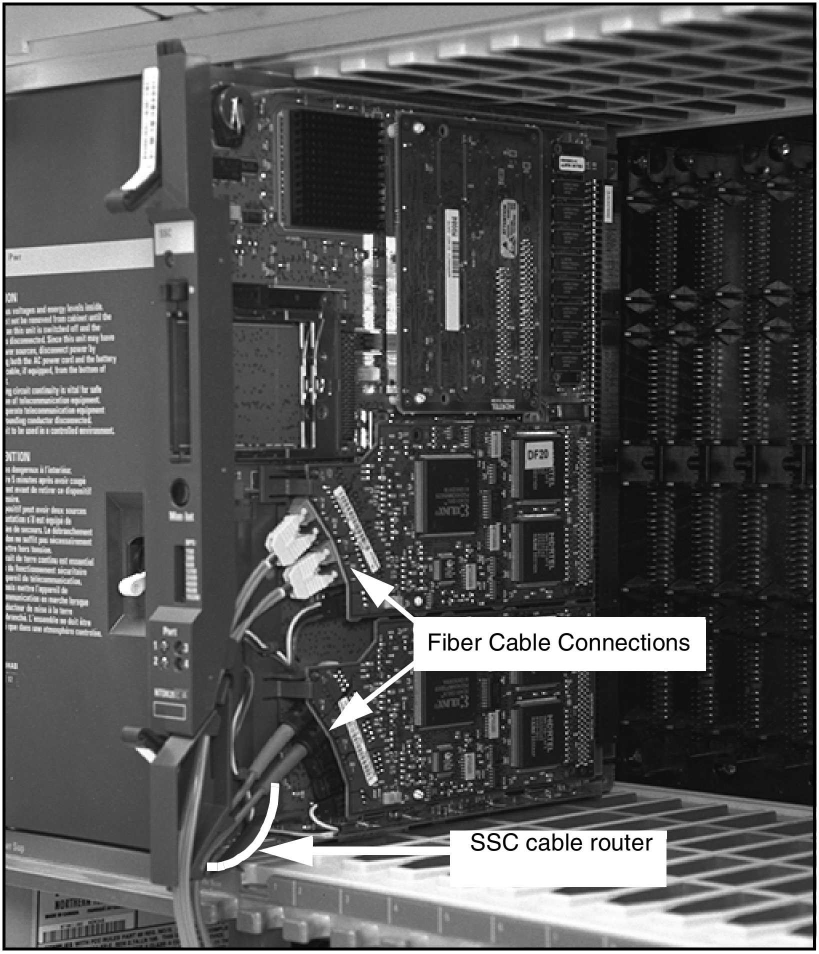
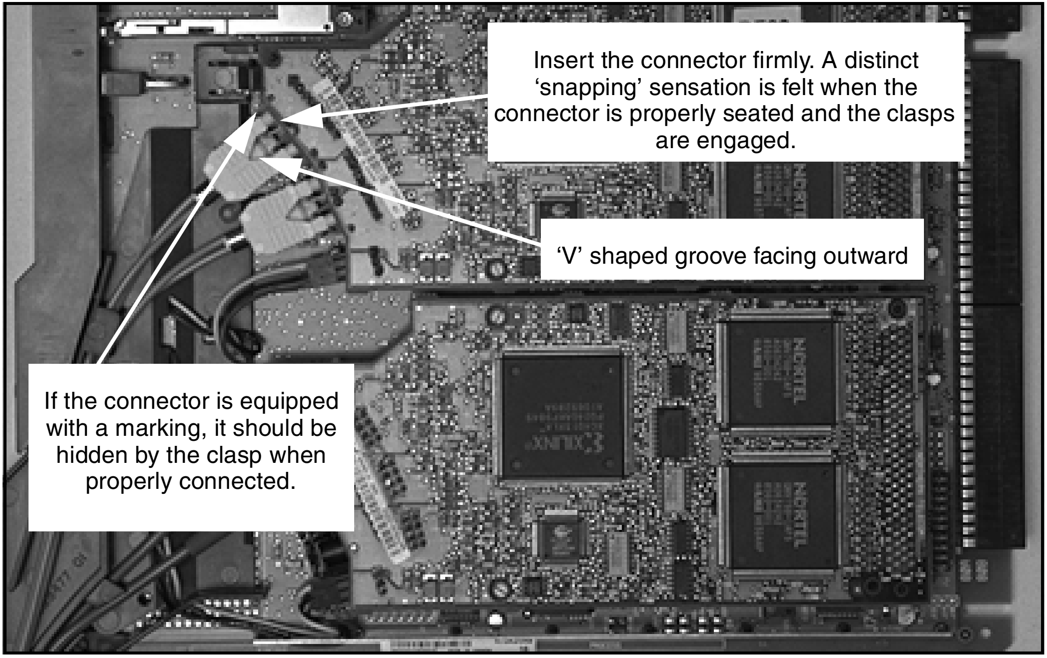

Fiber Cable Connections
SSC cable router

Figure 68
Plastic Fiber Cable Connection on Dual Port Daughterboard



Insert the connector firmly. A distinct 'snapping' sensation is felt when the connector is properly seated and the clasps are engaged.

'V' shaped groove facing outward

If the connector is equipped with a marking, it should be hidden by the clasp when properly connected.

Procedure 17
Installing glass fiber optic cable:

1 **Put on the anti-static wrist strap.**

2 **Place the SSC card on a clean flat surface.**

3 **Remove the protective plugs from one connector on the Fiber Daughterboard.**

4 **Remove the protective cap from the corresponding plug (Tx or Rx) on the glass fiber optic cable.**

5 **Insert the plug in its designated connector on the daughterboard. Once inserted, lock the connector in place by turning it a half turn clockwise. Refer to Figure 69 on page 163.**

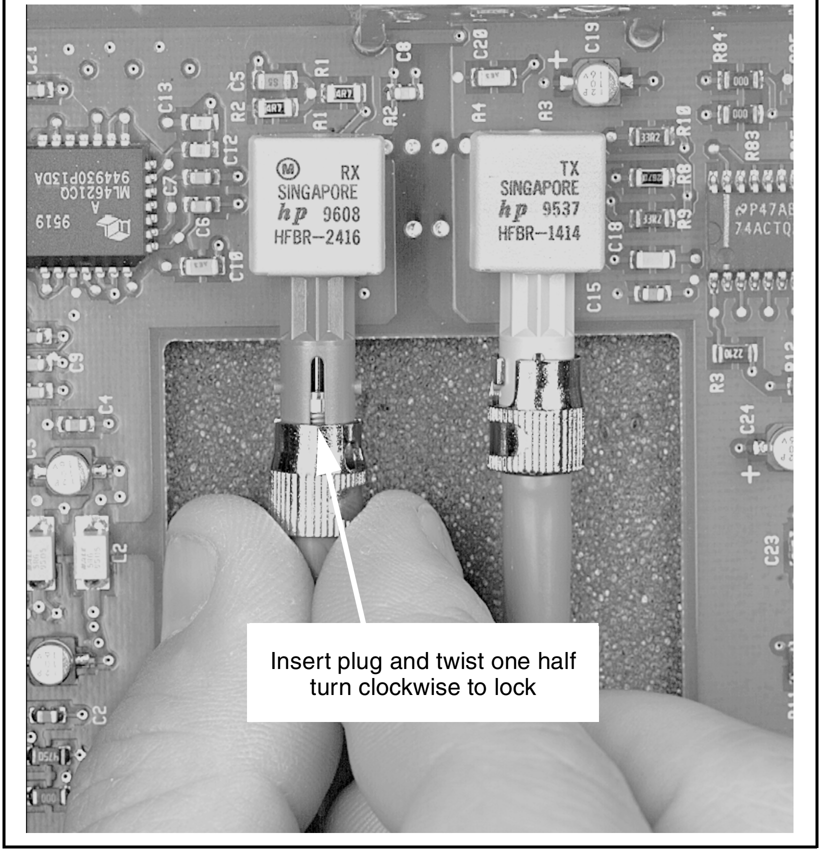
6 **Repeat the steps above for the remaining connector and plug.**

7 **Route the fiber cables through the SSC cable router on the SSC card. Refer to Figure 70 on page 164 for location of the cable router.**

8 **Insert the SSC card into slot "0" of the main Option 11C cabinet. Lock card into faceplate latches.**

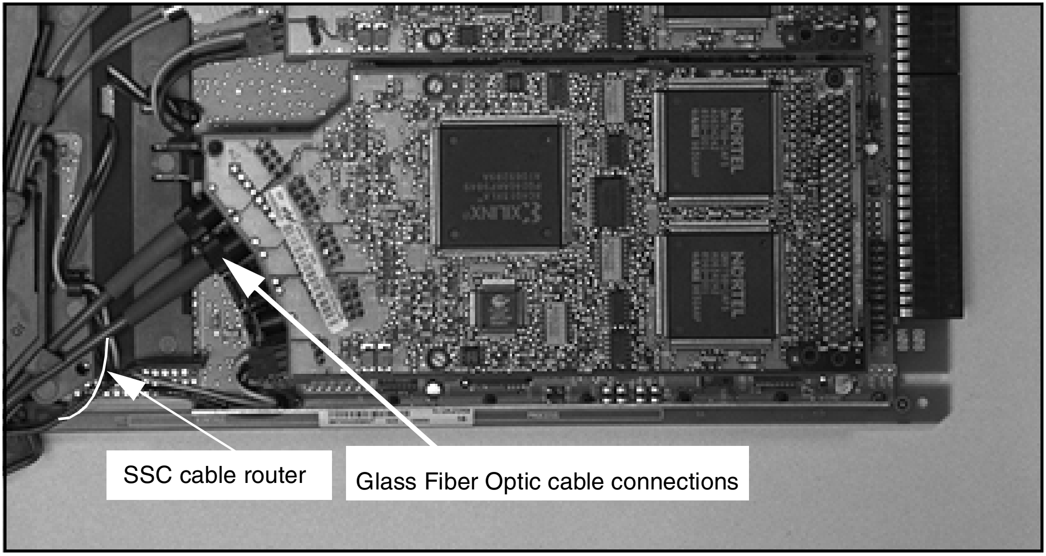
9 **Route the cables through the SSC cable routing guide under the main Option 11C cabinet as shown in Figure 59 on page 151.**

Figure 69
Glass fiber optic connection


RX
SINGAPORE
hp 9608
HFBR–2416
TX
SINGAPORE
hp 9537
HFBR–1414

Insert plug and twist one half turn clockwise to lock

Figure 70
Glass Fiber Optic Cable Connection



NTDK20 SSC installation on IP Expansion cabinets

IP expansion cabinets require an NTDK20 SSC card (minimum vintage is NTDK20CA) equipped with an IP daughterboard. This section describes the steps necessary to install the SSC cards, daughterboards, cables and any other components that are required on the SSC card.

Software Daughterboard and Security Device

- **Refer to Procedure 11 on page 144,** "Installing the Software Daughterboard and Security Device".

  Note: While the security device on the SSC card of the IP expansion cabinet is installed as described in Procedure 11 on page 144, the device itself is different. The security device for IP expansion cabinets is labelled "NT_REM" and is programmed to match the security device on the Main Option 11C cabinet.

IP Expansion Daughterboards

In an IP expansion cabinet, there are two choices of IP daughterboards:

- NTDK99 100BaseT - single port
- NTTK01 100BaseF - single port

The installation of these daughterboards is the same as described in Procedures 12 and 13 for the Main SSC card, with the following notable exceptions:

> ***Note 1:*** The IP daughterboard must be installed in the lower (i.e. port 2/4) expansion connector on the SSC card.
>
> ***Note 2:*** Record the MAC address and associated expansion cabinet number, to be used later in the software configuration.
>
> ***Note 3:*** Do not connect the SSC faceplate LED.

- **To install the 100BaseT single-port daughterboard refer to Procedure 12 on page 146.**
- **To install the 100BaseF single-port daughterboard refer to Procedure 13 on page 151**.

Expansion Cabinet Fiber Receiver Card

Procedure 18
Installing the fiber receiver card

1 **Install the fiber optic cable**:

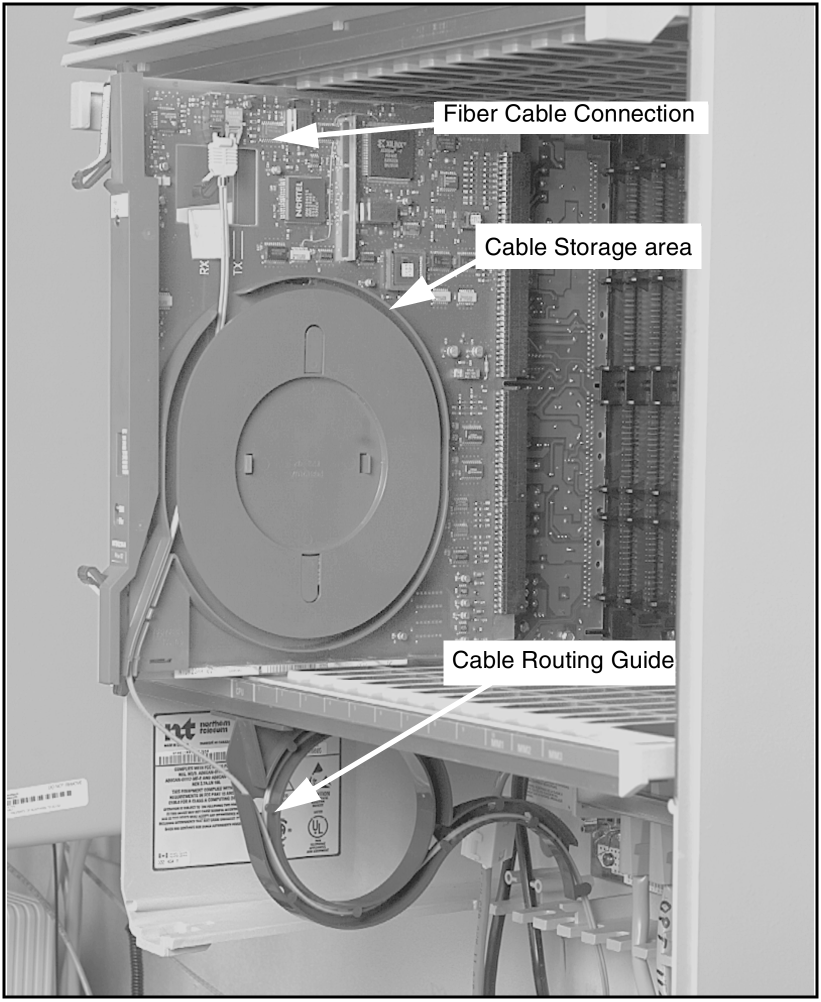
- To install the 10m plastic fiber optic cable refer to Procedure 16 on page 159
- To install glass fiber optic cable refer to Procedure 17 on page 162

2 **Insert the Fiber Receiver card in slot 0 of the expansion cabinet as shown in Figure 71 on page 167.**

3 **Route the Fiber Optic Cable around the Cable Routing Guide as shown in Figure 70 on page 164.**

Note: Be sure to wrap the cable a **minimum** of one complete loop around the Guide. This ensures sufficient cable for removing the fiber receiver card later.

Figure 71
Fiber receiver card in slot 0 of the fiber expansion cabinet


Fiber Cable Connection
Cable Storage area
Cable Routing Guide

Installing and connecting cross-connect terminals to cabinets

Contents

This section contains information on the following topics:

Reference list 169
General information 169
Terminal block requirements 170
Installing the BIX cross-connect terminal 171
Installing the Reichle Masari cross-connect terminal (Germany) 173
Installing the Krone Test Jack Frame for the UK 175
Connecting the cables 177

Reference list

The following are the references in this section:

- *Option 11C 1.5Mb DTI/PRI* (553-3011-310)
- *Option 11C 2.0Mb DTI/PRI* (553-3011-315)

General information

This chapter describes how to install and connect a cross-connect terminal to an Option 11C system, using either:

- a BIX cross-connect terminal
- a Reichle Masari cross-connect terminal, or
- a Krone Test Jack Frame

> ***Note:*** Although the use of the BIX system is not mandatory, it is the recommended choice.

This chapter contains the following procedures:

- Procedure 19 “Installing the BIX cross-connect terminal” on page 171
- Procedure 20 “Installing the Reichle Masari cross-connect terminal” on page 173
- Procedure 21 “Installing the KroneTest Jack Frame” on page 175
- Procedure 22 “Connecting the cables” on page 177

Terminal block requirements

The cross-connect terminal requires sufficient connecting blocks to terminate the following:

- up to ten 25-pair cables from each cabinet.
  - Each slot that is equipped with a trunk or line circuit card requires a cable.
    - The connectors J1 through J10 correspond to slot numbers 1 through 10 in the main cabinet.
    - Connectors J1 through J10 correspond to slot numbers 11 through 20 in the first expansion cabinet.
    - Connectors J1 through J10 correspond to slot numbers 21 through 30 in the second expansion cabinet.
    - Connectors J1 through J10 correspond to slot numbers 31 through 40 in the third expansion cabinet.
    - Connectors J1 through J10 correspond to slot numbers 41 through 50 in the fourth expansion cabinet.
    - Allow for additional cables at the cross-connect terminal if any of the ten slots in each cabinet are initially left vacant.
  - If the NTAK19EC 2-port SDI cable or NTAK19FB 4-port SDI cable are not used with the NTAK03 or NTAK02 cards, then a 25-pair cable is required for each of these cards.
- nine conductors comprising the AUX cable from each cabinet.

- one 25-pair cable from each QUA6 PFTU.
- wiring from telephones and trunks.

WARNING

Always use caution when installing or modifying telephone lines. Avoid installing telephone wiring during a lightning storm. Never touch uninsulated telephone wiring unless the line has been disconnected at the network interface.

Installing the BIX cross-connect terminal

Procedure 19 describes how to install the BIX cross-connect terminal.

Procedure 19
Installing the BIX cross-connect terminal

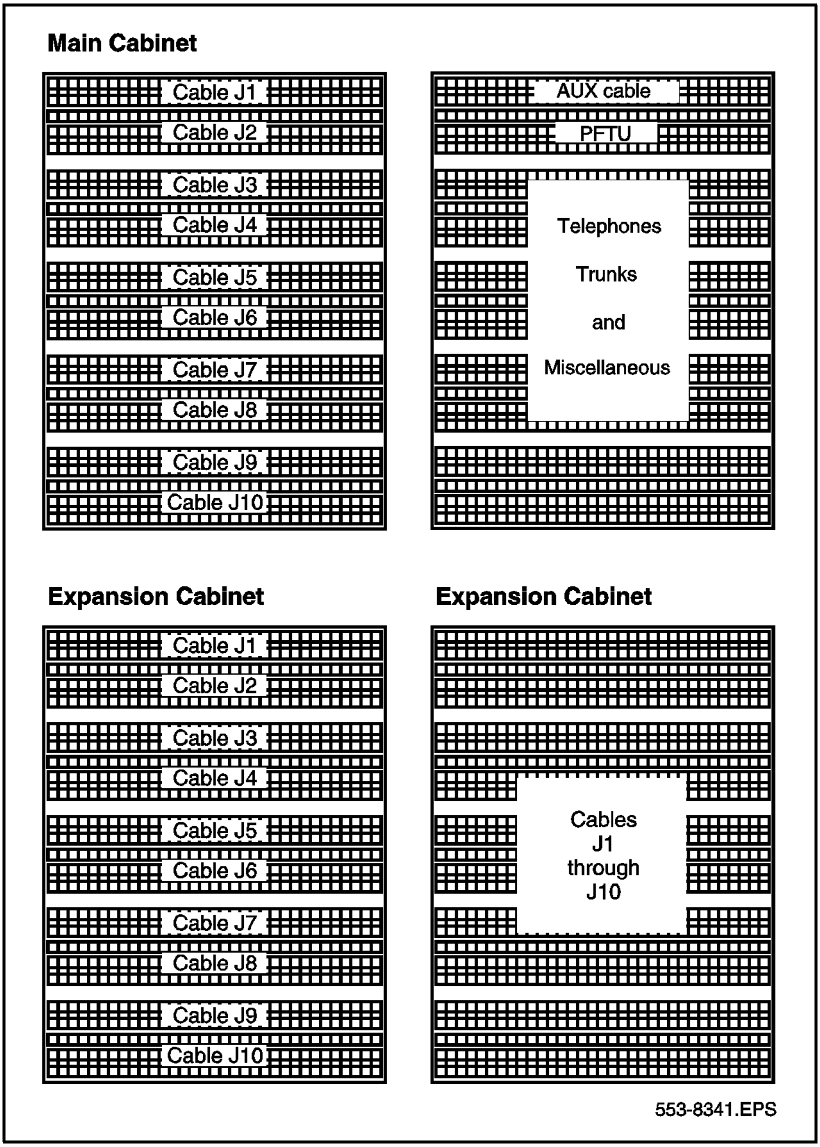
1 **Consult the equipment layout plan to determine where the cross-connect terminal should be located.** Refer to "System and site requirements" on page 35**.**

2 **Install the terminal blocks in a layout similar to that shown in Figure 72 on page 172.**

3 **Attach labels on the cross-connect terminal to indicate the terminal blocks assigned to:**

  - 25-pair cables from the cabinets
  - AUX wiring
  - Power fail transfer units
  - Telephones and consoles
  - Trunks
  - other miscellaneous equipment

Figure 72
Typical BIX cross-connect terminal layout


Main Cabinet
Cable J1
Cable J2
Cable J3
Cable J4
Cable J5
Cable J6
Cable J7
Cable J8
Cable J9
Cable J10
AUX cable
PFTU
Telephones
Trunks
and
Miscellaneous
Expansion Cabinet
Cable J1
Cable J2
Cable J3
Cable J4
Cable J5
Cable J6
Cable J7
Cable J8
Cable J9
Cable J10
Expansion Cabinet
Cables
J1
through
J10
553-8341.EPS

Installing the Reichle Masari cross-connect terminal (Germany)

Procedure 20 describes how to install the Reichle Masari cross-connect terminal.

Procedure 20
Installing the Reichle Masari cross-connect terminal

1 **Consult the equipment layout plan to determine where the cross-connect terminal should be located.** Refer to “System and site requirements” on page 35.

2 **Install the terminal blocks in a layout similar to that shown in Figure 73 on page 174.**

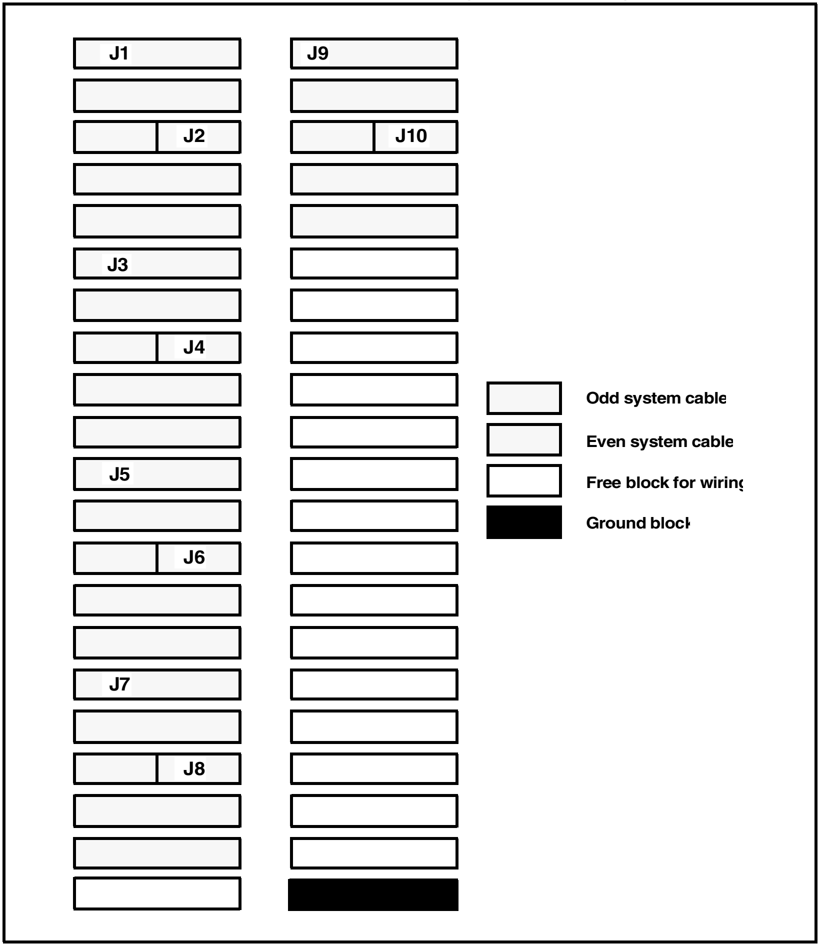
3 **Attach labels on the cross-connect terminal to indicate the terminal blocks assigned to:**

- 25-pair cables from the cabinets
- AUX wiring
- Power fail transfer units
- Telephones and consoles
- Trunks
- Analogue line cards)
- DC5/AC15/RAN/PAG cards
- Data Access Cards
- Digital line cards
- Exchange line trunk cards
- Direct Dialing Inward trunk cards
- other miscellaneous equipment

4 **Ground the cross-connect terminal**

Connect a 16 mm^2 (10 mm^2 green-yellow ground wire for Germany) ground wire from the ground bar on the cross-connect terminal to the ground lug in each cabinet.

Figure 73
Reichle Masari cross-connect terminal layout (Germany)


J1
J9
J2
J10
J3
J4
J5
J6
J7
J8
Odd system cable
Even system cable
Free block for wiring
Ground block

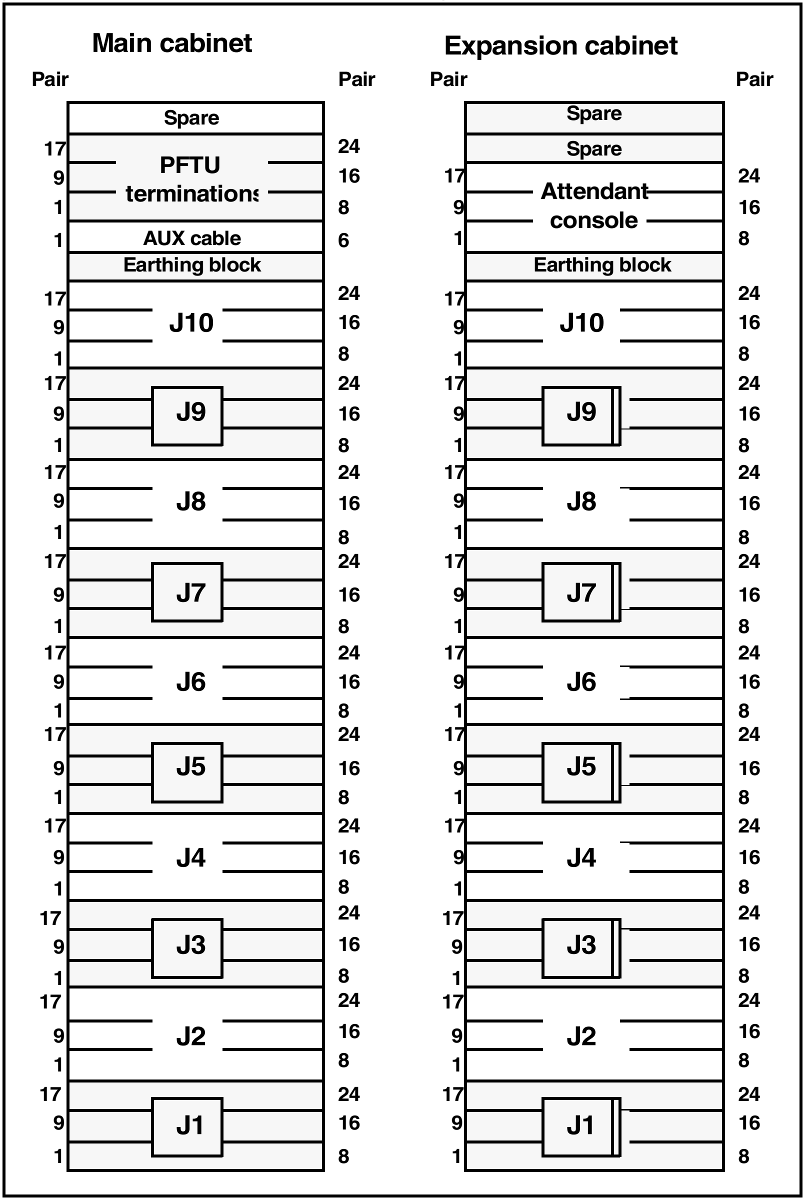
Installing the Krone Test Jack Frame for the UK

Procedure 21 describes how to install the Krone Test Jack Frame

Procedure 21
Installing the KroneTest Jack Frame

1. **Consult the equipment layout plan to determine where the cross-connect terminal should be located.** Refer to “System and site requirements” on page 35.
2. **Install the terminal blocks in a layout similar to that shown in Figure 74 on page 176.**
3. **Attach labels on the cross-connect terminal to indicate the terminal blocks assigned to:**
    - AUX wiring
    - Power fail transfer units
    - Telephones and consoles
    - Analogue line cards
    - DC5/AC15/RAN/PAG cards
    - Data Access Cards
    - Digital line cards
    - Exchange line trunk cards
    - Direct Dialing Inward trunk cards
    - other miscellaneous equipment

Figure 74
Typical Krone cross connect terminal layout



Main cabinet
Expansion cabinet
Pair
Pair
Pair
Pair
Spare
Spare
Spare
PFTU terminations
Attendant console
AUX cable
Earthing block
Earthing block
J10
J9
J8
J7
J6
J5
J4
J3
J2
J1
17
9
1
24
16
8
6

Connecting the cables

Each Option 11C system cabinet requires up to ten 25-pair cables. Each cabinet requires an additional terminal block at the cross-connect terminal for the termination of the 9-pin conductor auxiliary cable.

All cables are connected at the bottom of the cabinet and are routed through the openings in the lower part of the cabinet.

> ***Note:*** Care must be taken when using NE-A25B cables with the NTAK02, and NTAK03 cards, as these cables are not wired out to station equipment or trunk circuits.

For 1.5 Mb and 2.0 Mb DTI/PRI related wiring and cabling information, refer to *Option 11C 1.5Mb DTI/PRI* (553-3011-310), and *Option 11C 2.0Mb DTI/PRI* (553-3011-315).

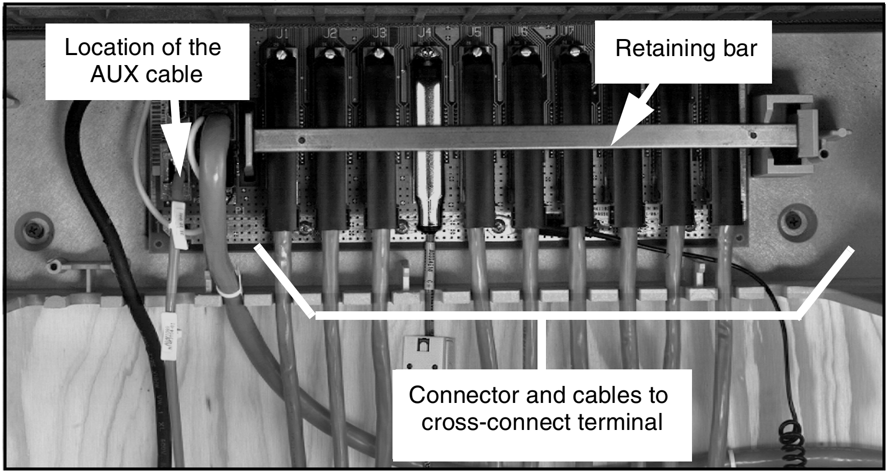
Procedure 22
Connecting the cables

1. **Remove the connector retaining bar from the connector panel in the lower part of each cabinet.** See Figure 75 on page 178.
2. **Using the card slot allocation plan, connect a 25-pair cable to each of the connectors that will contain a line or trunk card.**

   Make sure to tag both ends of each cable with the cabinet and connector numbers.

   Note: Do not use the NE-A25B cable with the NTAK10, NTAK79, or NTBK50 circuit cards.

Figure 75
Cable connectors in a system cabinet


Location of the AUX cable
Retaining bar
Connector and cables to cross-connect terminal

3 **Route the cables down through the opening at the bottom of each cabinet.**

4 **Replace the retaining bar when you have connected all the cables to the cabinet.**

5 **Terminate all the 25-pair cables installed at the cross-connect terminal.**

Label all the cables at the cross-connect terminal blocks according to the card slot allocation plan.

6 **Install the AUX cable on the lower 9-pin connector located on the left side of the connector area in the lower part of each cabinet.**

Terminate the AUX cable at the cross connector located on the left side of the connector according to Figure on page 178.

Table 16
Table of AUX cable terminations

Color	Wire number	Designation	Connection
W-BL	1	BRTN	to QUA6-J1 1R
BL-W	2	BRTN	to QUA6-J1 2R
O-W	3	-48V AUX (250mA)	to QUA6-J1 25T, 25R
W-O	4	PFTS	to QUA6-J1 2T
G-W	5	-15V AUX	Console power*
W-G	6	+15V AUX	Console power*

* Each AUX cable can provide power for only one console.

Installing power fail transfer units

Contents

This section contains information on the following topics:

General information 181
Installing the PFTU 182
PFTU control lead signals 186

General information

Procedure 23 on page 182 of this chapter describes how to install a QUA6 Power Fail Transfer Unit (PFTU).

PFTUs can be connected to the expansion cabinets as well as to the main cabinet. Only one PFTU is supported per cabinet.

> ***Note:*** The QUA6 Power Fail Transfer Unit operates with loop-start and ground-start CO trunks. However, with ground-start trunks the associated telephone set must be equipped with a ground-start button.

If Power Fail Backup is required as a fail safe for this system, use analog trunks since digital trunks are not supported by a PFTU.

Installing the PFTU

Consult the equipment layout plan to determine where the PFTU should be located.

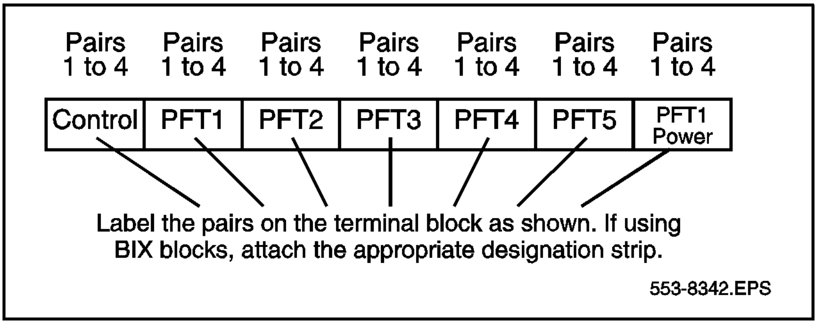
Procedure 23
Installing the PFTU

1 **Mount the PFTU on the wall near the system cross-connect terminal and secure it with four screws.**

2 **Install an NE-A25B-type 25-pair cable from connector J1 on the faceplate of the PFTU to its assigned location at the cross-connect terminal.**

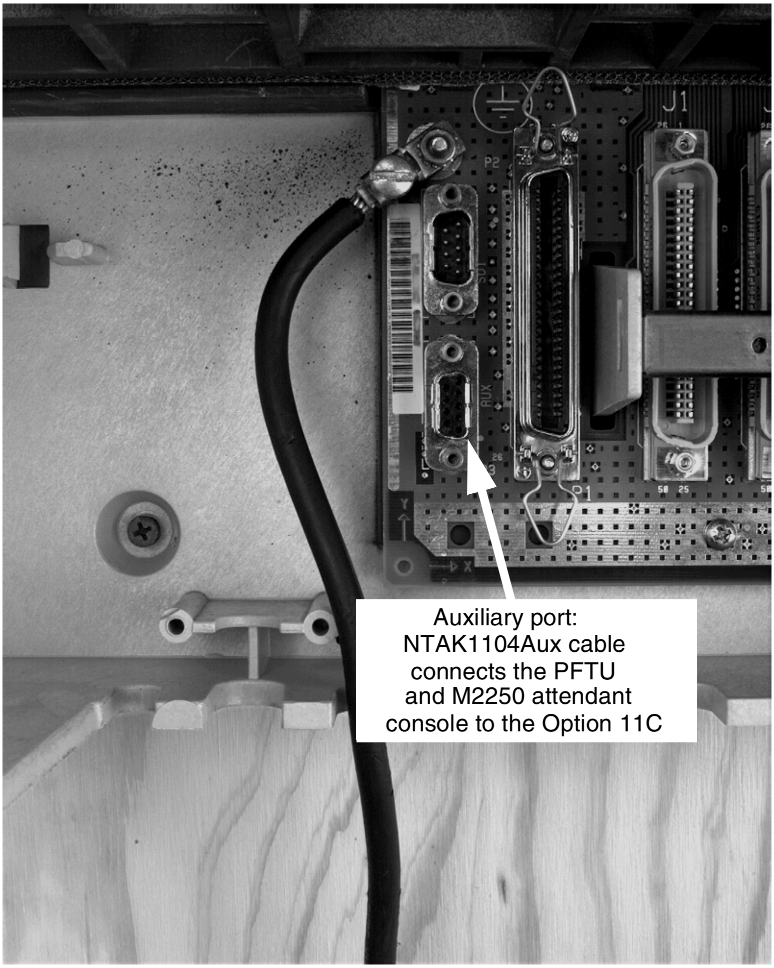
3 **Label the pairs of the J1 cable on the cross-connect terminal block as shown in Figure 76 on page 182.**

Figure 76
J1 cable labeling


Pairs 1 to 4
Pairs 1 to 4
Pairs 1 to 4
Pairs 1 to 4
Pairs 1 to 4
Pairs 1 to 4
Pairs 1 to 4
Control
PFT1
PFT2
PFT3
PFT4
PFT5
PFT1 Power
Label the pairs on the terminal block as shown. If using BIX blocks, attach the appropriate designation strip.
553-8342.EPS

4 **Connect the PFTU power and control connections to the AUX cable (see Figure 77 on page 183) from the cabinet.** Refer to Table 77, “Auxiliary port location,” on page 183**.**

Figure 77
Auxiliary port location



Auxiliary port:
NTAK1104Aux cable
connects the PFTU
and M2250 attendant
console to the Option 11C

Table 17
Control and power connections on cable J1

J1 Cable from QUA6 (see Figure 78 on page 185)				
Function	**Pair Number**	**Pair Color**	**Connects to**	**Cross-connect to**
Control	1T	W-BL	(ALM)	Not used.
	1R	BL-W	BRTN	W-BL 1-dot connection on AUX cable from the cabinet
	2T	W-O	PFTS	W-O 1-dot connection on AUX cable from the cabinet. Transfer initiated by applying ground to this lead.
	2R	O-W	BRTN	BL-W 1-dot connection on AUX cable from the cabinet
	3T	W-G	(TC)	Console transfer switch. See console connections. Transfer initiated by applying ground to this lead.
	3R	G-W		Not used.
	4T	W-BR		Not used.
	4R	BR-W		Not used.
PFTU Power	25T 25R	S-V V-S	-48 V -48 V	O-W 1-dot connection on AUX cable. Maximum 250 mA draw on O-W lead.

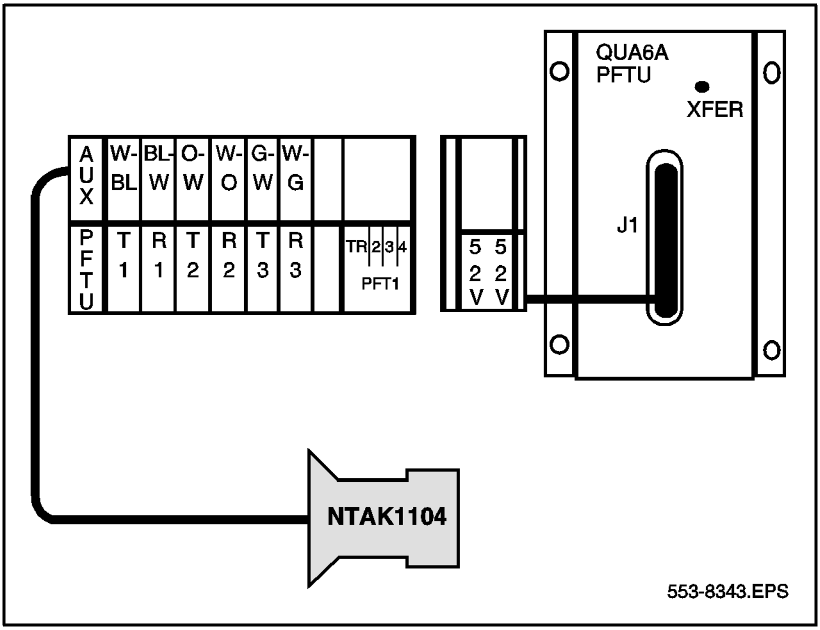
5 Connect the attendant console to the PFTU:

- attendant console 14 Tip (14T) to ground
- 3 Tip (3T) of PFTU to 11 Ring (11R) of attendant console (power fail transfer switch)
- attendant console 11 Tip (11T) to ground.

If power to the M2250 attendant console is not provided by two Digital Line card TNs, connect;

- G-W of AUX to 8 Tip (8T) of attendant console (-15 volts),
- W-G of AUX to 7 Tip (7T) of attendant console (+15 volts).

Figure 78
Power Fail Transfer


QUA6A
PFTU
XFER
J1
AUX
W-BL
BL-W
O-W
W-O
G-W
W-G
PFTU
T 1
R 1
T 2
R 2
T 3
R 3
TR 2 3 4
PFT1
52V
52V
NTAK1104
553-8343.EPS

PFTU control lead signals

To connect PFTUs from other manufacturers, use the information provided in the following table:

Table 18
PFTU control lead signals

NTAK1104 Aux. Cable Lead	Lead State when PFTU in Non-Transferred State	Lead State when PFTU in Transferred State
BRTN	GROUND	GROUND
BRTN	GROUND	GROUND
-48V AUX	-48V DC (250 mA max.)	-48V DC (250 mA max.)
PFTS	OPEN	GROUND

Note 1: Refer to Figure 77 on page 183 for an illustration of where the Auxiliary cable connects to the Option 11C system.

Note 2: If power is removed from the QUA6, a transfer of the PFTU may also be invoked.

Installing the circuit cards

Contents

This section contains information on the following topics:

Reference list 187
General information 187
Circuit cards 188
NTAK02 SDI/DCH card 188
NTAK03 TDS/DTR card 190
NT8D14 Universal Trunk card 191
NT8D15 E&M Trunk card 192
NTAG26 XMFR card 193
NT5K21 XMFC card 193
NT1R20 Off-Premise Station (OPS) analog line card 194

Reference list

The following are the references in this section:

- *Circuit Card: Installation and Testing* (553-3001-211)

General information

This chapter describes how and where to install various circuit cards available for use in the Option 11C system. This chapter does not include information on the NTDK20 SSC card or the Fiber Receiver cards. For information on these cards, refer to "Installing System Controller Cards" on page 143.

Always handle circuit cards with care to avoid damaging them due to static electricity. Always store unused circuit cards in an anti-static bag or the original packaging.

CAUTION

An anti-static wrist strap, provided in the bottom of the cabinet, must be worn when handling circuit cards. Static electricity can damage the components of circuit cards.

Circuit cards

A circuit card displaying a symbol of a switch on its faceplate is equipped with option switches or strapping plugs or both. Other circuit cards, such as the NTDK20 Small System Controller (SSC) card, are capable of mounting daughterboards and other add-on devices. Refer to “Chapter 12” for information on installing the NTDK20 card.

The following circuit cards are commonly used in the Option 11C system. A complete list of circuit cards requiring settings can be found in *Circuit Card: Installation and Testing* (553-3001-211).

NTAK02 SDI/DCH card

Before inserting the NTAK02 SDI/DCH card into its slot, you must set the switches and attach the jumper plugs.

> ***Note 1:*** This circuit card can be installed in both the main cabinet and IP expansion cabinets.

> ***Note 2:*** Only DCH is supported in IP expansion cabinets. ESDI, AML, and TTY are not supported.

The NTAK02 SDI/DCH switches allow you to configure the four SDI ports on the Main cabinet as a combination of the following:

- SDI
- ESDI, or
- DCH/DPNSS

The NTAK02 SDI/DCH card uses jumper plugs to configure the RS232/RS422 interfaces as:

- DTE, or
- DCE

Procedure 24
NTAK02 circuit card installation

1 **Set the switches and jumper plugs for the NTAK02 SDI/DCH card according to the following tables.**

Table 19
Switch settings

Port 0	**Port 1**	**SW 1-1**	**SW 1-2**
SDI	DCH	OFF	OFF
SDI	DPNSS	OFF	ON
—	ESDI	ON	ON

Table 20
More switch settings

Port 2	**Port 3**	**SW 1-3**	**SW 1-4**
SDI	DCH	OFF	OFF
SDI	DPNSS	OFF	ON
—	ESDI	ON	ON

Table 21
Jumper settings

Port	Jumper location	Strap for DTE	Strap for DCE	Jumper location	RS422	RS232
Port 0	J10	C - B	B - A			
Port 1	J7 J6	C - B C - B	B - A B - A	J9 J8	C - B C - B	B - A B - A
Port 2	J5	C - B	B - A			
Port 3	J4 J3	C - B C - B	B - A B - A	J2 J1	C - B C - B	B - A B - A

2 **Insert the card in its assigned slot.**

The NTAK02 SDI/DCH card may be installed in card slots 1 through 10.

3 **Connect an NTAK19FB four port cable (or an NE-A25-B cable) from the corresponding connector at the bottom of the cabinet.** If using an NE-A25-B cable, terminate it at the cross-connect terminal (since the NTAK19FB cable is equipped with connectors, it does not require termination at the cross-connect terminal).

NTAK03 TDS/DTR card

The function of the NTAK03 TDS/DTR card is provided on the NDK20EA SSC card. However, the TDS/DTR card can coexist with the SSC card if you wish to access extra TDS/DTR units or SDI ports. These functions must be manually programmed in the software overlays.

> ***Note:*** The system may not operate properly if an NTAK03 circuit card is installed in a slot connected to telephones. Refer to“Installing and connecting SDI and ethernet ports” on page 213, to connect an NTAK03 circuit card to the cross-connect terminal.

Procedure 25
NTAK03 card installation

1 **Insert the card in its assigned slot.**

The NTAK03 TDS/DTR card may be inserted into any of the card slots 1 through 9.

2 **Connect an NTAK19EC cable (or an NE-A25-B cable) from the corresponding connector at the bottom of the cabinet.** If you are using an NE-A25-B cable, terminate it at the cross-connect terminal (since the NTAK19EC cable is equipped with connectors, it does not require termination at the cross-connect terminal).

NT8D14 Universal Trunk card

The universal trunk card provides eight analog trunks which can function in the modes shown in the following table.

This line card can be installed in slots 1 through 10 in the main cabinet or 11 through 30 in the expansion cabinets.

Procedure 26
Universal Trunk card installation

1 **Set the jumpers for the NT8D14 Universal Trunk circuit card according to the following table.**

Table 22
NT8D14 Universal trunk — modes and option settings (Part 1 of 2)

Modes	Location	Jumper strap
Central (CO)	J1, J2	OFF
2-way tie trunk (loop Dial Repeat)	J1, J2	OFF
2-way tie trunk (Outgoing Incoming Dial)	J1, J2	OFF
Recorded Announcement (RAN)	J1, J2	OFF
Paging trunk	J1, J2	OFF
Japan CO/DID operation	J1, J2	OFF

Table 22
NT8D14 Universal trunk — modes and option settings (Part 2 of 2)

DID operation Loop length>2000 Ω	J1, J2	ON
DID operation Loop length <2000 Ω	J1, J2	OFF
OFF indicates no strap present. J1 and J2 locations apply to all eight trunks.		

2 **Insert the card in its assigned slot.**

The NT8D14 Universal Trunk card may be installed in card slots 1 through 30.

NT8D15 E&M Trunk card

This trunk card provides four trunks which can function as 2W E&M, 4W E&M, and Paging.

Procedure 27
E&M Trunk card installation

1 **Set the switches (see the following table) for the NT8D15 E&M trunk circuit card according to the following table.**

Table 23
NT8D15 E&M Trunk card option settings

Mode of operation	J2	J9
4W — Type 1	ON	connect pins 2 - 3
4W — Type 2	ON	connect pins 2 - 3
2W — Type 1	ON	connect pins 2 - 3
Paging trunk	ON	connect pins 2 - 3

2 **Insert the card in its assigned slot.**

The NT8D15 E&M Trunk card can be installed in card slots 1 through 30.

NTAG26 XMFR card

The function of the XMFR (Extended Multi-Frequency Receiver) card is provided on the NDK20EA SSC card. However, this card can coexist with the SSC card if access to extra XMFR capability is required.

The XMFR card is used to receive MF digit information. Connections are made between a PBX and a CO. Features such as Automatic Number Identification (ANI), Meridian 911 (M911) and Feature Group D (FGD) are supported on the Option 11C by the IPE MF Receiver.

Procedure 28
XMFR card installation

1 **Insert the NTAG26 card in its assigned slot.**

The NTAG26 card can be installed in slots 1 through 30.

2 **Configure and enable the card through overlay 13 and 34.**

After the card is enabled, the LED will flash three times to indicate it is conducting a self-test. If the LED remains lit, then the self-test has failed.

NT5K21 XMFC card

The function of the XMFC (Extended Multi-frequency Compelled Sender/Receiver) card is provided on the NDK20EA SSC card. However, this card can coexist with the SSC card if you wish to access extra XMFC capability.

The XMFC card provides four channels of R2 Standard signalling capability.

Procedure 29
XMFC card installation

1 **Insert the NT5G21 card in its assigned slot.**

The card can be installed in slots 1 through 30.

2 **Configure and enable the card through overlay 13 and 34.**

After the card is enabled, the LED will flash three times to indicate it is conducting a self-test. If the LED remains lit, then the self-test has failed.

NT1R20 Off-Premise Station (OPS) analog line card

The OPS analog line card provides eight OPS lines. The card can be installed in slots 1 through 10 in the main cabinet or 11 through 50 in the expansion cabinets.

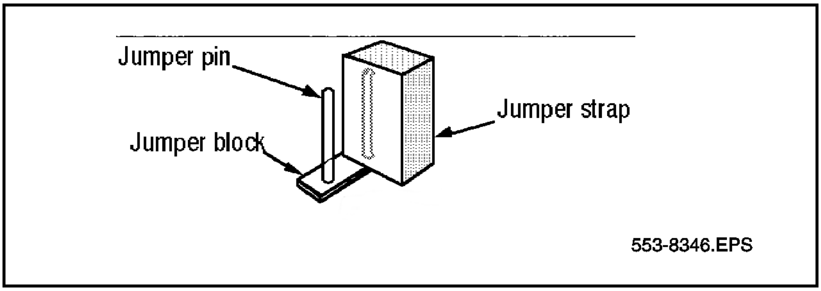
Procedure 30
OPS Analog card installation

1 **Set the jumpers on the NT1R20 OPS card.**

Each line interface unit, on the card, is equipped with two jumper blocks that are used to select the proper loop current, depending upon loop length (Refer to Table on page 194 and Figure 80 on page 196).

For units connected to loops of 460 to 2300 ¾, both jumper blocks for that unit must have jumper straps installed. For loops that are 460 ¾ or less, jumper straps are not installed.

Figure 79
Set the jumpers



2 **Insert the OPS card in its assigned slot.**

The card may be installed in card slots 1 through 50.

3 **Cross connect off-premise telephones as described in "Connecting the trunks" on page 277.**

Refer to Figure 81 on page 197 for cross connection information for the OPS card.

Table 24
OPS analog line card configuration

Application	**On-premise station (ONS)**			**Off-premise station (OPS)**			
Class of service (Note 1)	ONS			OPS			
Loop resistance	0 - 460 ohms			0 - 2300 ohms			
Jumper strap setting (Note 6)	Both JX. 0 and JX.1 off			Both JX. 0 and JX. 1 off		Both JX. 0 and JX. 1 on	
Loop loss dB (Note 3)	0-1.5	>1.5-2.5	2.5-3.0	0-1.5	1.5-2.5	2.5-3.0	4.5-15
TIMP (Note 1, 4)	600¾	600¾	600¾	600¾	600¾	600¾	600¾
BIMP (Note 1, 4)	600¾	3COM1	3COM2	600¾	3COM 1	3COM 2	3COM 2
Gain treatment (Note 5)	No						Yes

Note 1: Configured in the Single line Telephone Administration program (LD 10).
Note 2: The maximum signaling range supported by the OPS analog line card is 2300 ohms.
Note 3: Loss of untreated (no gain devices) metallic line facility. Upper loss limits correspond to loop resistance ranges for 26 AWG wire.
Note 4: Default software impedance settings are:
ONS CLSOPS CLS
TIMP: 600 ohms 600 ohms
BIMP: 600 ohms 3COM2
Note 5: Gain treatment, such as a voice frequency repeater (VFR) is required to limit the actual OPS loop loss to 4.5 dB, maximum. VFR treatment of metallic loops having untreated loss greater than 15dB (equivalent to a maximum signaling range of 2300 ohms on 26 AWG wire) is not recommended.
Note 6: Jumper strap settings JX> 0 and JX. 1 apply to all eight units; “X” indicates the unit number, 0-7. “OFF” indicates that a jumper strap is not installed across both pins on a jumper block. Store unused straps on the OPS analog line card by installing them on a single jumper pin as shown below.

Figure 80
OPS analog line card: jumper block locations

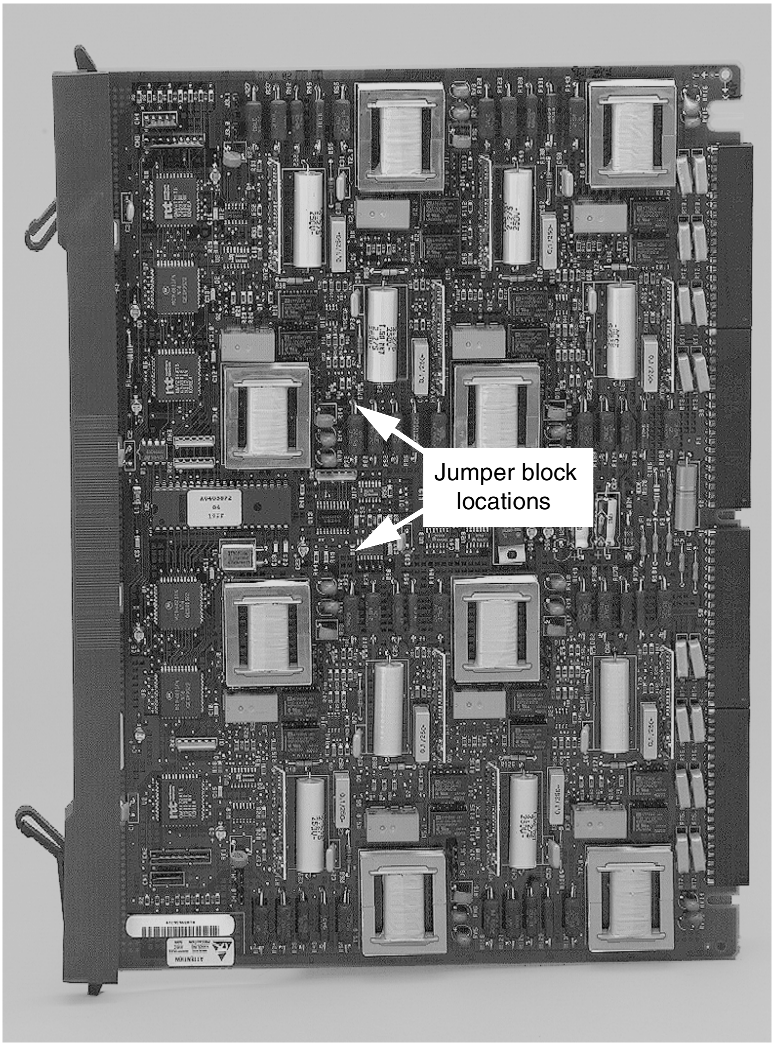
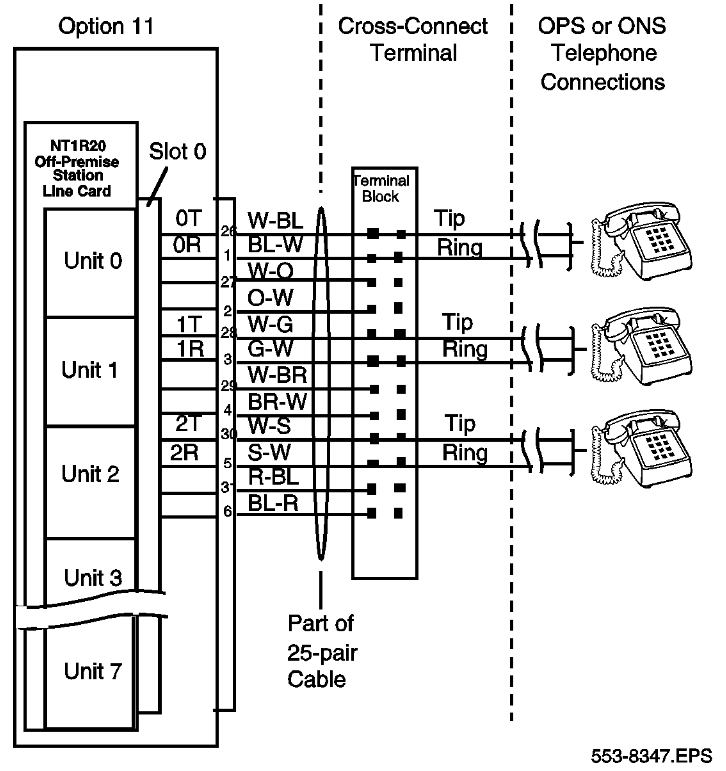

Jumper block locations

Figure 81
OPS analog line card cross connections


Option 11
Cross-Connect Terminal
OPS or ONS Telephone Connections
NT1R20 Off-Premise Station Line Card
Slot 0
Unit 0
Unit 1
Unit 2
Unit 3
Unit 7
0T
0R
1T
1R
2T
2R
26
1
27
2
28
3
29
4
30
5
31
6
W-BL
BL-W
W-O
O-W
W-G
G-W
W-BR
BR-W
W-S
S-W
R-BL
BL-R
Terminal Block
Tip
Ring
Tip
Ring
Tip
Ring
Part of 25-pair Cable
553-8347.EPS

Installing and connecting reserve power supplies

Contents

This section contains information on the following topics:

Reference list 199
General information 199
Types of reserve power 199
Installing the NTAK75 battery unit 200
Installing the NTAK76 battery unit 204
Connecting other battery backup systems 209

Reference list

The following are the references in this section:

- *Option 11C and 11C Mini Technical Reference Guide* (553-3011-100)

General information

This chapter describes how to install and connect a reserve DC power supply to Option 11C cabinets.

If installing a multiple-cabinet system, each cabinet must have its own reserve power supply.

Types of reserve power

The types of reserve battery power are:

- The NTAK75 battery box, which has the following features:

  - designed to be float-charged by the NTAK04 or NTDK78 ac/dc power supply
  - provides a minimum of 2 hours of reserve DC power
  - mounts to the floor
  - supports one system cabinet

- The NTAK76 battery box, which has the following features:
  - designed to be float-charged by the NTAK04 or NTDK78 ac/dc power supply
  - provides a minimum of 15 minutes of reserve DC power
  - mounts to the wall
  - supports one system cabinet

- An Uninterruptible Power Supply (UPS) which will provide a continuous AC power supply. Install this unit according to the manufacturer’s instructions.

CAUTION

If the NTAK04 or NTDK78 ac/dc power supply is powered down while it is operating on DC reserve power from a battery backup unit, the Option 11C system cannot be powered up again until AC power is restored. Be careful not to open the circuit breaker, either on the battery backup unit or on the NTAK04 or NTDK78, while the system is operating on battery backup.

Installing the NTAK75 battery unit

Follow the steps in Procedure 31 on page 201 to install an NTAK75 battery unit. Repeat the procedure for each system cabinet being installed.

> ***Note:*** The system external ground must be installed before installing the battery backup unit.

Procedure 31
NTAK75 Battery Unit installation

1 **Unpack the NTAK75 battery unit and place it according to the equipment layout plan.**

- The battery unit must be a installed within 3 ft (915 mm) of the cabinet it is serving.
- Install to the side or below the Option 11C cabinet; not above.
- If installed below, the minimum clearance from the top of the NTAK75 to the bottom of the wall mounted Option 11C cabinet is 2 ft (610 mm).
- The battery unit should be installed in an open, well-ventilated area.
- The area must meet the following temperature limits:

Maximum allowed range: 0 ° to 45° C (32 to 110°F)
Recommended range: 20 ° to 35° C (68 to 95 °F).

2 **Remove its cover.**

The cover is secured by two captive screws on the front of the box.

3 **Set the switch on the top of the NTAK75 battery box to OFF.**

4 **Unpack the batteries and check the expiry dates.**

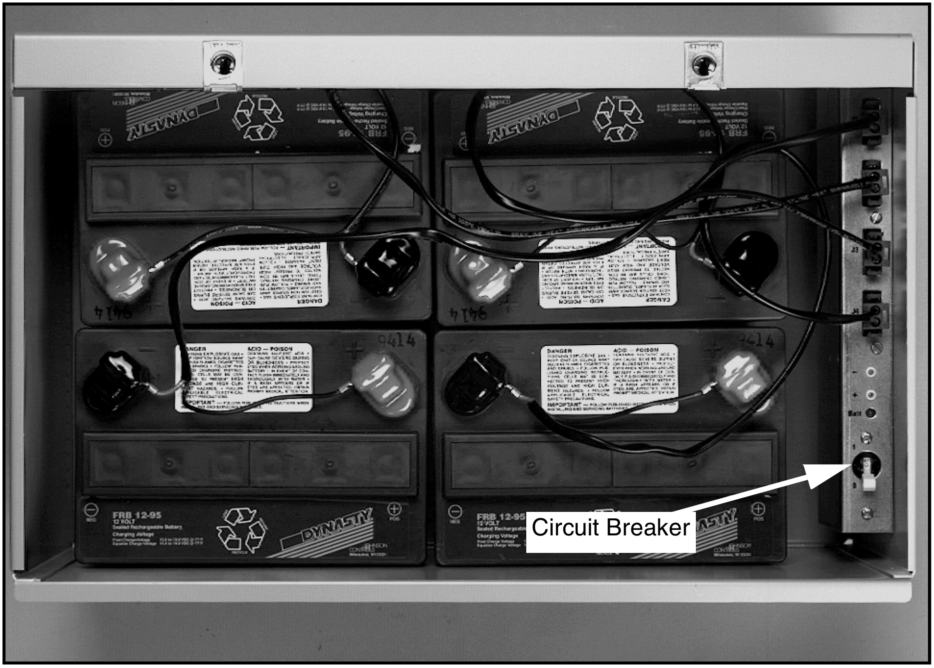
If the batteries do not have the same dates, contact your supplier.

WARNING

The battery cells can deliver high currents when short-circuited. Make sure that you do not inadvertently short-circuit the terminals of the batteries.

5 **Place the individual batteries into the battery box (see Figure 82 on page 202).**

Figure 82
NTAK75 Battery Backup — Top View



6 **Locate the four black/red jumper cables supplied with the NTAK75.**

7 **Connect the battery packs by installing the jumper cables between the +/- terminals of one battery pack to the connectors marked “J1 - J4.”**

Any of the batteries may be attached to any connector (J1 - J4).

8 **Ensure the jumper wires are securely fastened by pulling out on the tabs of the connector.**

9 **Switch the NTAK75 breaker to the ON position.**

If the batteries are properly installed, the green LED will light. If this occurs, switch the breaker to OFF and proceed with step 10. If the LED does not light, return to Step 7 and check the wiring of the batteries.

10 **Set the breakers on the NTAK75 and NTAK04 or NTDK78 to OFF.**

11 **Plug the NTAK0420 cable from the battery box into the power supply in the cabinet (Figure 83 on page 204).**

Secure the cable with the cable retainer inside the cabinet.

12 **Set the breaker on the NTAK04 or NTDK78 to ON. The BATT LED on the NTAK04 or NTDK78 will remain off, indicating that the battery box breaker is OFF.**

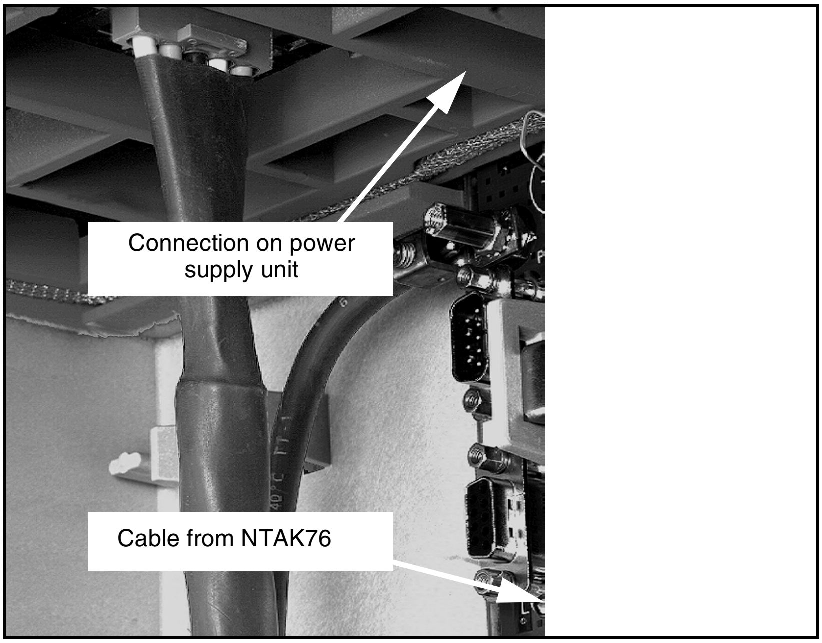
The LED on the NTAK75 will light indicating that the NTAK0420 cable connections are correct.

13 **Set the breaker on the NTAK75 to ON.**

The BATT LED on the NTAK04 or NTDK78 will be lit.

14 **Install the cover on the NTAK75.**

Figure 83
Cable connections



Installing the NTAK76 battery unit

Follow Procedure 32 on page 204 to install an NTAK76 battery unit. Repeat the procedure for each system cabinet being installed.

> *Note:* The system external ground must be installed before installing the battery backup unit.

Procedure 32
NTAK76 Battery Unit installation

1 **Unpack the NTAK76 battery unit and place it according to the equipment layout plan**.

- The battery unit must be installed within 3 ft (915 mm) of the cabinet it is serving.

- The battery unit must be installed beside or below the Option 11C cabinet; not above.
- If installed below, the minimum clearance from the top of the NTAK76 to the bottom of the wall mounted Option 11C cabinet is 2 ft (610 mm).
- The battery unit should be installed in an open, well-ventilated area.
- The area must meet the following temperature limits:

Maximum allowed range: 0 °to 45° C (32 to 110°F)
Recommended range: 20 ° to 35° C (68 to 95 °F)

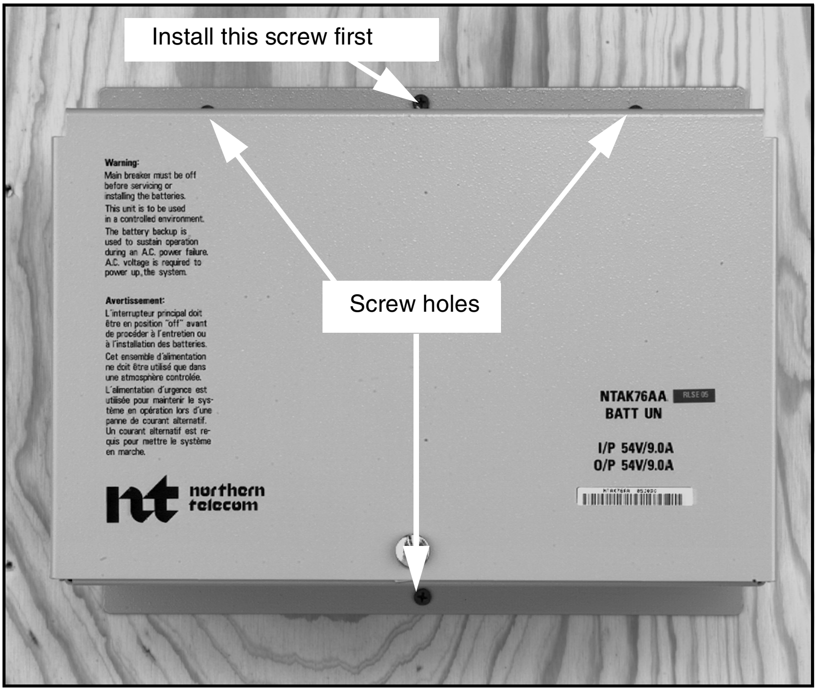
2 Remove the cover

The cover is secured by one captive screw on the front of the box. (Refer to Figure 84 on page 206).

3 Mount the battery unit to the wall using the four #8 3/4 inch wood screws provided with the unit.

Install the center screw at the top of the battery unit. Level the unit and install the remaining screws.

Figure 84
Mounting the NTAK76 battery unit to the wall


Install this screw first
Screw holes
Warning:
Main breaker must be off before servicing or installing the batteries.
This unit is to be used in a controlled environment.
The battery backup is used to sustain operation during an A.C. power failure. A.C. voltage is required to power up the system.
Avertissement:
L'interrupteur principal doit être en position "off" avant de procéder à l'entretien ou à l'installation des batteries.
Cet ensemble d'alimentation ne doit être utilisé que dans une atmosphère controlée.
L'alimentation d'urgence est utilisée pour maintenir le système en opération lors d'une panne de courant alternatif. Un courant alternatif est requis pour mettre le système en marche.
northern telecom
NTAK76AA
RLSE 05
BATT UN
I/P 54V/9.0A
O/P 54V/9.0A

4 **Set the switch on the front of the NTAK76 battery box to OFF. (Refer to Figure 85 on page 207).**

WARNING

The battery cells can deliver high currents when short-circuited. Make sure that you do not inadvertently short-circuit the terminals of the batteries.

5 **Unpack the batteries and check the expiry dates.**

If the batteries do not have the same dates, contact your supplier.

6 **Place the batteries in the battery unit with the terminal end down. Hold the batteries in place with the restraining bar.**

7 **Locate the three white jumper wires and the red and black jumper cables supplied with the NTAK76 battery unit.**

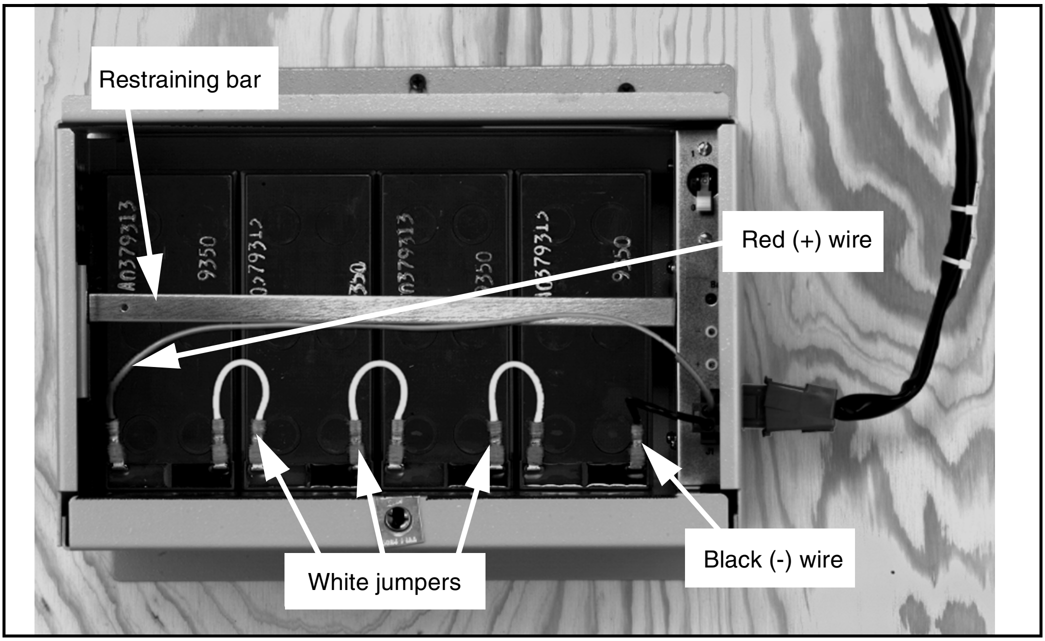
8 **Connect the battery packs in series by connecting the white jumper wires between the + (red) terminal of one battery pack to the - (black) terminal of the next battery pack. (See Figure 85 on page 207).**

9 **Connect the remaining red and black jumper cable to red and black terminals of the first and fourth battery pack.**

10 **Connect the jumper cable to the NTAK76 breaker panel, marked J1. (See Figure 85 on page 207).**

Note: The red positive (+) wire connects to the red (+) post of battery 1. The black negative (-) wire connects to the black post (-) of battery 4. Ensure all connections are secured.

Figure 85
Jumper connections



11 **Set the breaker in the battery unit to ON to test for correct wiring.**

The NTAK76 green LED (BATT) should switch on.

DC voltage can be measured between the test points whenever the green BATT LED is lit on the NTAK76. The test points are protected by high resistance: it is impossible to damage the battery unit by short-circuiting the test points to each other or to the metal case. For valid readings the test points must not be short circuited. The following different voltage readings can be made:

- open circuit battery voltage when the NTAK0420 cable is disconnected and the NTAK76 circuit breaker is closed
- NTAK04 or NTDK78 DC output when the NTAK0420 cable is connected and the NTAK76 circuit breaker is open
- NTAK04 or NTDK78 float charge voltage when the NTAK0420 cable is connected and the NTAK76 circuit breaker is closed

12 **Set the breaker on the NTAK76 battery unit and the breaker on the NTAK04 or NTDK78 power supply to OFF.**

13 **Plug the NTAK0420 cable from the battery box into the power supply in the cabinet. See Figure 86 on page 209.**

Secure the cable with the cable retainer inside the cabinet.

14 **Set the breaker on the Option 11C power supply to ON.**

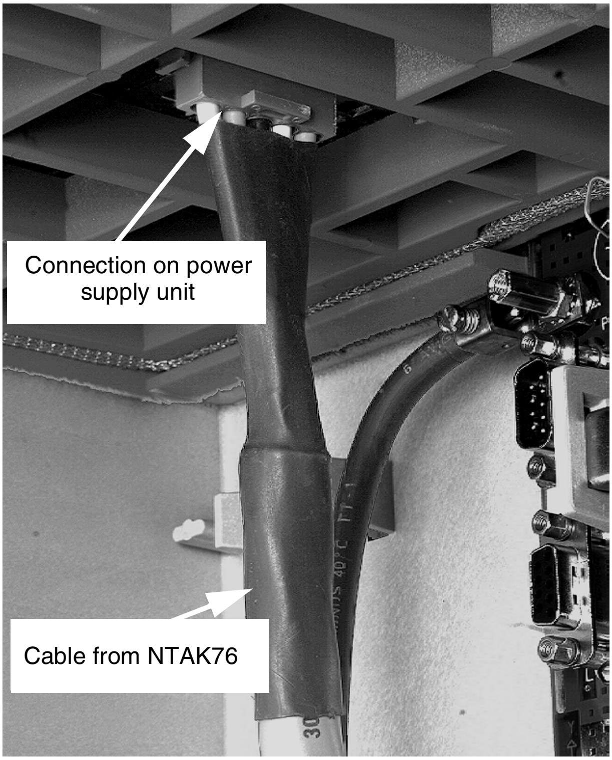
The NTAK04 or NTDK78 “BATT” LED should be off and the NTAK76 LED should be on.

15 **Set the breaker on the NTAK76 battery unit to ON.**

The NTAK04 or NTDK78 “BATT” LED should be lit and the NTAK76 LED should be on.

16 **Replace the cover on the system cabinet and secure the latch.**

Figure 86
Power cord routing



Connecting other battery backup systems

This procedure describes how to install and connect customer-supplied battery backup systems.

Charging capabilities of the Option 11C are described in the *Option 11C and 11C Mini Technical Reference Guide* (553-3011-100). The system external ground must be installed before installing the battery backup.

Procedure 33
Installing other battery systems

1 **Unpack the battery box and place it according to the equipment layout plan.**

2 **Remove its cover.**

3 **Set the switch on the battery box to OFF.**

4 **Unpack the batteries and check the expiry dates.**

If the batteries do not have the same dates, contact your supplier.

> **WARNING**
>
> The battery cells can deliver high currents when short-circuited. Make sure that you do not inadvertently short-circuit the terminals of the batteries.

5 **Place the batteries in the battery box.**

6 **Locate the black wires supplied with the box.**

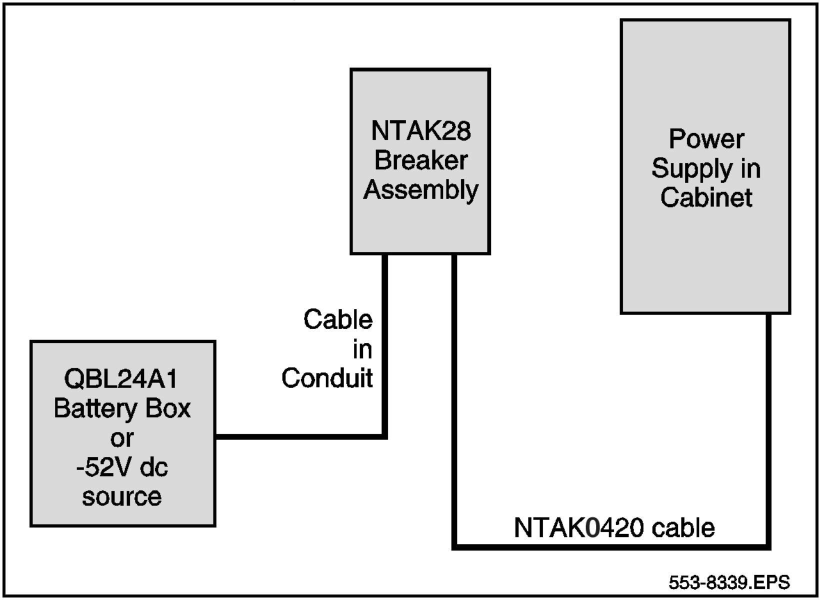
7 **Connect the battery packs in series by installing the black wires between the + (large) terminal of one battery pack to the - (small) terminal of the next battery pack.**

8 **Connect the black wire inside the battery box to the remaining positive (+) terminal and the red wire to the remaining negative (-) terminal.**

9 **Mount the NTAK28 Junction box securely to the wall within 900 mm (36 in.) of the cabinet it is serving. See Figure 87 on page 211.**

Note: One NTAK28 Junction box is required for each cabinet.

Figure 87
NTAK28 breaker assembly location


NTAK28
Breaker
Assembly
Power
Supply in
Cabinet
Cable
in
Conduit
QBL24A1
Battery Box
or
-52V dc
source
NTAK0420 cable
553-8339.EPS

10 **Set the breakers on the NTAK28 Junction box and on the NTAK04 or NTDK78 power supply to OFF.**

11 **Connect the NTAK0420 cable from the NTAK28 junction box to the power supply in the cabinet.**

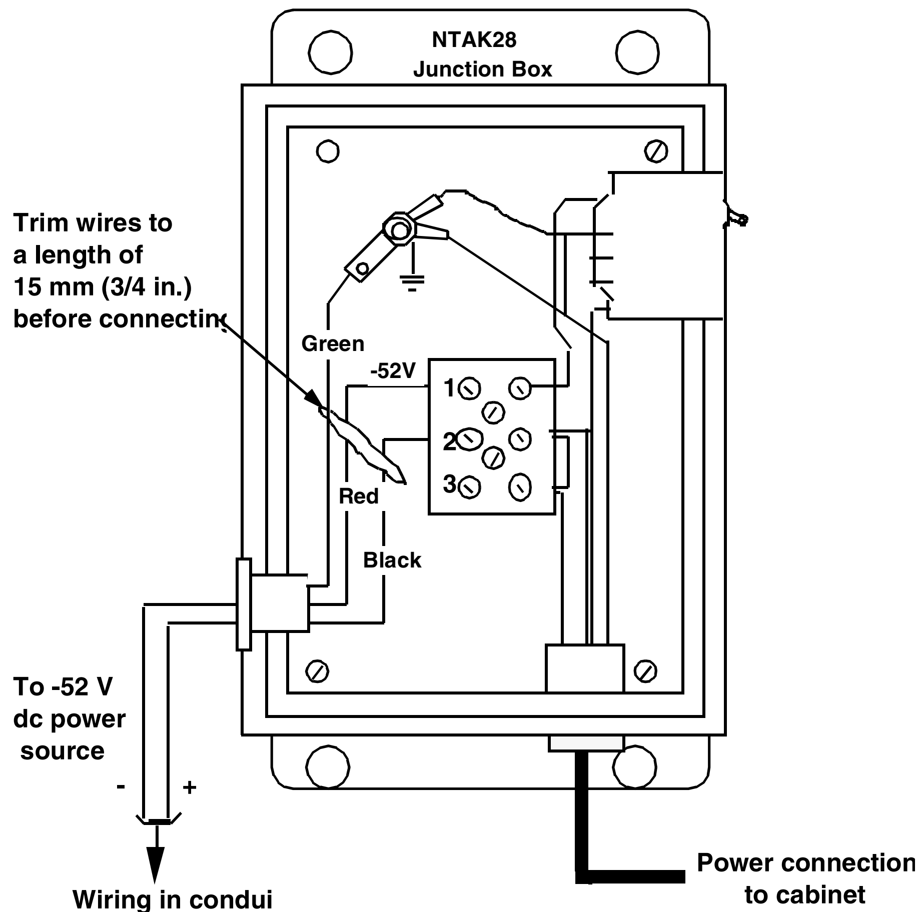
Secure the cable with the cable retainer in the cabinet.

12 **Connect the other end of the DC power cable to the connector on the NTAK28 Junction Box.**

13 **Connect the cable from the battery box to the NTAK28 Junction box as shown in Figure 88 on page 212.**

14 **Set the breakers on the NTAK28 Junction box and on the NTAK04 or NTDK78 ac/dc power supply to ON.**

Figure 88
NTAK28 circuit breaker assembly


NTAK28
Junction Box
Trim wires to
a length of
15 mm (3/4 in.)
before connectin
Green
-52V
1
2
3
Red
Black
To -52 V
dc power
source
-
+
Wiring in condui
to battery box
Power connection
to cabinet

Wire Gauge	Max. Length
# 6	50 ft (15 m)
# 8	30 ft (9 m)
# 10	20 (6 m)

Installing and connecting SDI and ethernet ports

Contents

This section contains information on the following topics:

Reference list 213
General information 213
Modem setup requirements 214
Installing and connecting SDI ports 215
NTDK20 card 215
NTDK23, NTDK25 and NTDK80 Fiber Receiver cards 217
NTAK02 SDI/DCH card 218
NTAK03 TDS/DTR card 222
Terminal setup 224
Installing and connecting an ethernet cable 228

Reference list

The following are the references in this section:

- *Maintenance* (553-3001-511)

General information

This Chapter contains modem setup requirements and two procedures for connecting communication devices to the Option 11C. The first explains how to install and connect SDI ports to terminals and modems. Instructions are provided on how to access ports through the NTDK20, NTDK23, NTDK25, NTDK80, NTAK02 and NTAK03 cards. The second procedure shows how to install and connect an ethernet cable to the Option 11C main cabinet.

Option 11C SDI ports are provided by the following cards:

- NTDK20 Small System Controller (SSC) card: provides three SDI ports
- NTDK23, NTDK25 and NTDK80 Fiber Receiver cards: each provides one SDI port
- NTAK02 SDI/DCH card: provides four ports of which up to two can be SDI ports
- NTAK03 TDS/DTR card: provides two SDI ports.

> ***Note:*** The functionality of the NTAK03 card has been incorporated into the NDK20EA Small System Controller (SSC) card. The Option 11C, however, supports these cards in conjunction with the SSC card.

Modem setup requirements

Modems connected to Option 11C should be set as follows:

- CD (Carrier Detect): Active if carrier detected on incoming call
- CTS (Clear to Send): Normal operation or forced active
- Hardware and software: Disabled flow control.

The ports on Option 11C will be disabled if devices connected to them generate extra “garbage” characters. For this reason, modems should not be used in the following modes:

- Loopback
- Auto Echo
- Self Test.

> ***Note:*** The SDI ports are designed for use with “dumb” modems. “Intelligent” modems may be used, however care must be taken to ensure that they do not enter into modes of operation that will send extra characters to the system.

Table 25 on page 215 lists some of the problems that may be encountered.

Table 25
Modem problems

Problem	Solution
CDR is not printing on an ESDI port configured as 8 bits, no parity, and 1 stop bit.	Change the modem set-up to 7 bits, no parity, 1 stop bit, or add MTC or SCH to the ESDI user prompt.
Modem is not communicating with the Option 11C when the User is MTC, BUG or CTY (The default setting of 8 bits, no parity, 1 stop bit is incompatible with the modem).	Change the modem set-up to 7 bits or the parity to EVEN/ODD.

Installing and connecting SDI ports

NTDK20 card

The baud rate for port 0 is controlled by a switch setting on the circuit card's faceplate. Ports 1 and 2 are user configurable in LD 17.

- Port 0 is the only SDI port that can be used for software installation and upgrades.
- All three ports on the NDK20EA SSC card can be used to connect terminals or modems.
- An NTBK48 3-port SDI cable must be used with the NDK20EA SSC card.

Note: The default baud rate of the SSC card is 1200 bps; the maximum data rate is 19,200 bps. When changing the DIP switch on the faceplate, make sure only one baud rate switch is set to ON. Refer to Table 26 on page 216.

Table 26
Default port configuration for the NDK20EA SSC card

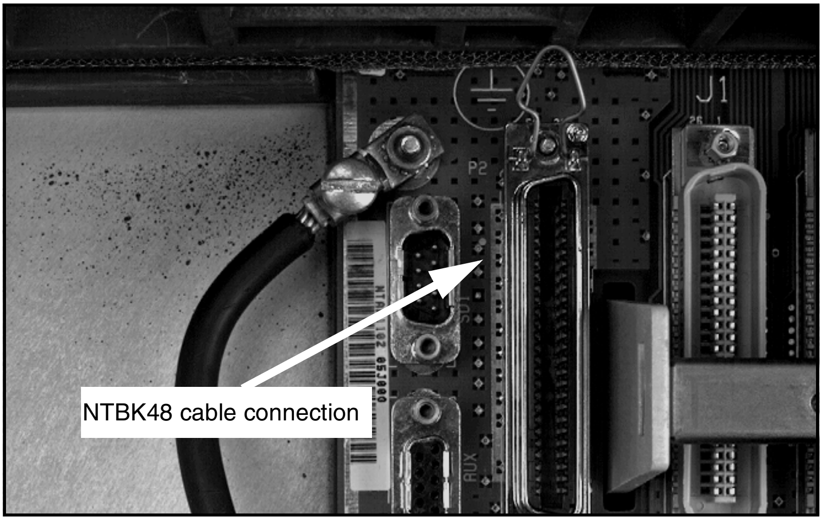
Port	Use	Baud rate	Data bits	Stop bits	Parity
0	MTC/SCH/BUG	Set by a DIP switch	8	1	None
1	MTC/SCH/BUG	1200 (See Note 1)	8	1	None
2	MTC/SCHBUG	1200 (See Note 2)	8	1	None

Procedure 34 on page 216 describes how to connect a terminal, modems and other devices such as CDR devices and additional TTYs to the SSC card.

Procedure 34
Connecting SDI ports on the SSC card

1 **Connect the NTBK48 3-port SDI cable to the 9-pin SDI connection at the top of the main or IP expansion cabinet.**

Figure 89
Cable connection



2 **Connect the system terminal to the cable marked "port 0" on the NTBK48 3-port cable.**

A Modem Eliminator Adapter is required to connect the Option 11C to a TTY terminal.

3 **If the system is to be accessed remotely, connect the system modem to the cable marked "port 1" on the NTBK48 cable.**

4 **Connect the modem to an outside line.**

5 **Test the modem for proper operation once the system is operating.**

Note: The remaining ports can be used for other equipment such as CDR devices or TTYs.

NTDK23, NTDK25 and NTDK80 Fiber Receiver cards

The Fiber Receiver cards provide one SDI port per expansion cabinet.

The baud rate is set by a DIP switch on the card's faceplate. Other communication settings are identical to the port 0 configuration on the SSC card (Refer to Table 26 on page 216).

A Fiber Receiver card port must be configured using LD 17 before it can be used to access overlays.

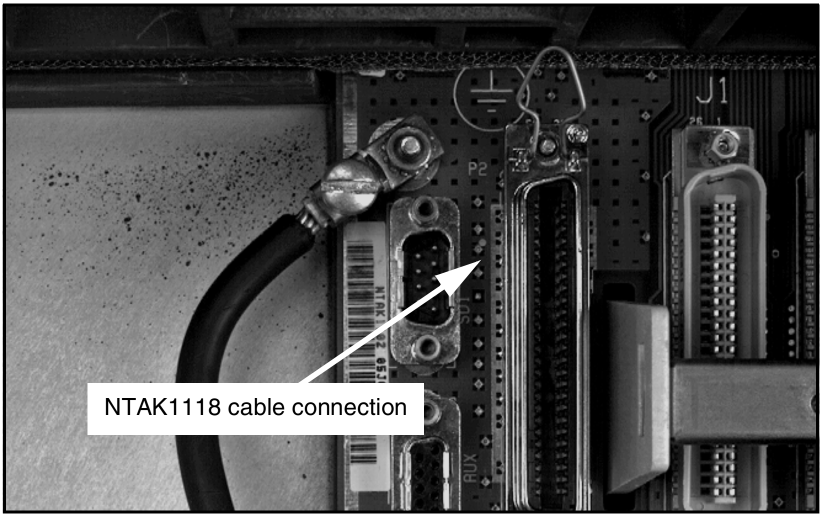
> ***Note:*** Although all device numbers can be assigned to any cabinet, TTY 0, 1 and 2 are usually assigned to the main cabinet. TTY 3, 4, 5, and 6 are typically assigned to the first, second, third, and fourth expansion cabinets respectively.

Procedure 35 on page 217 describes how to connect the SDI ports on Fiber Receiver cards.

Procedure 35
Connecting SDI ports to the Fiber Receiver card

1 **Connect the NTAK1118 one-port SDI cable to the 9-pin SDI connection at the bottom of the expansion cabinet.** See Figure 90 on page 218**.**

Figure 90
Cable connection



2 **Connect the NTAK1118 SDI cable to a TTY terminal.**

Note: A Modem Eliminator is required to connect to a terminal.

3 **If the system is to be accessed remotely, connect the SDI cable to the system modem.**

4 **Connect the modem to an outside line.**

5 **Test the modem for proper operation once you have started up the Option 11C system.**

NTAK02 SDI/DCH card

The NTAK02 SDI/DCH card can be used in the main and IP expansion cabinets.

It can be configured to support ports for the following:

- two SDI and two DCHI
- one SDI, one DCHI, two ESDI
- four ESDI

> ***Note:*** Only the DCH functionality is supported in IP Expansion cabinets. ESDL, AML and TTY are not supported.

NTAK02 ports can be used to access overlay software. These ports should be defined in the configuration database as the SDI logical type.

An NTAK19FB 4-port SDI cable is designed for use with the NTAK02 circuit card. However, an NE-A25B-type 25-pair cable can be used to extend the connections to the cross-connect terminal. See Table 27 on page 219 through Table 30 on page 221 for the connections for each port.

Table 27
NTAK02 pinouts — Port 0 at the cross-connect terminal

Cable		**RS232**			
		Signal		**Designations (I=input/O=output)**	
Pair	**Color**	**DTE**	**DCE**	**DTE**	**DCE**
1T	W-BL	0	0	–	–
1R	BL-W	DTR	DCD	O	I
2T	W-O	DSR	CH/CI	I	O
2R	O-W	DCD	DTR	I	O
3T	W-G	RTS	CTS	O	I
3R	G-W	CTS	RTS	I	O
4T	W-BR	RX	TX	I	O
4R	BR-W	TX	RX	O	I
5T	W-S	–	–	–	–
5R	S-W	SG	SG	–	–

Table 28
NTAK02 connections at the cross-connect terminal — Port 1

Cable		RS422				RS232			
		Signal		Designations (I=input O=output)		Designations (I=input O=output)		Signal	
Pair	Color	DTE	DCE	DTE	DCE	DTE	DCE	DTE	DCE
5T	W-S	SCTEA	SCTA	O	I	O	I	SCT	SCT
5R	S-W	–	–	–	–	–	–	–	–
6T	R-BL	SCTEB	SCTB	O	I	–	–	CH/CI	–
6R	BL-R	DTR	DCD	O	I	–	–	DTR	DCD
7T	R-O	DSR	CH/CI	I	O	I	O	DSR	CH/CI
7R	O-R	DCD	DTR	I	O	I	O	DCD	DTR
8T	R-G	RTS	CTS	O	I	O	I	RTS	CTS
8R	G-R	CTS	RTS	I	O	I	O	CTS	RTS
9T	R-BR	SCRA	SCTEA	I	O	I	O	SCR	SCT
9R	BR-R	SCTA	RXCA	I	O	I	O	SCT	–
10T	R-S	SCRB	SCTEB	I	O	–	–	–	–
10R	S-R	SCTB	RXCB	I	O	–	–	–	–
11T	BK-BL	RXDA	TXDA	I	O	I	O	RXD	TXD
11R	BL-BK	TXDA	RXDA	O	I	O	I	TXD	RXD
12T	BK-O	RXDB	TXDB	I	O	–	–	–	–
12R	O-BK	TXDB	RXDB	O	I	–	–	–	–
25T	V-S	SG	SG	–	–	–	–	SG	SG
25R	S-V	–	–	–	–	–	–	–	–

Table 29
NTAK02 connections at the cross-connect terminal — Port 2

Cable		RS422				RS232			
		Signal		Designations (I=input O=output)		Designations (I=input O=output)		Signal	
Pair	**Color**	**DTE**	**DCE**	**DTE**	**DCE**	**DTE**	**DCE**	**DTE**	**DCE**
13T	BK-G			–	–	–	–	–	–
13R	G-BK			–	–	O	I	DTR	DCD
14T	BK-BR			–	–	I	O	DSR	CH/CI
14R	BR-BK			–	–	I	O	DCD	DTR
15T	BK-S			–	–	O	I	RTS	CTS
15R	S-BK			–	–	I	O	CTS	RTS
16T	Y-BL			–	–	I	O	RX	TXD
16R	BL-Y			–	–	O	I	TX	RXD
17T	Y-O			O	I	O	I	–	–
17R	O-Y			–	–	–	–	SG	SG

Table 30
NTAK02 connections at the cross-connect terminal — Port 3 (Part 1 of 2)

Cable		RS422				RS232			
		Signal		Designations (I=input O=output)		Designations (I=input O=output)		Signal	
Pair	**Color**	**DTE**	**DCE**	**DTE**	**DCE**	**DTE**	**DCE**	**DTE**	**DCE**
17T	Y-O	SCTEA	SCTA	O	I	O	I	SCT	SCT
17R	O-Y	–	–	–	–	–	–	–	–
18T	Y-G	SCTEB	SCTB	O	I	–	–	CH/CI	–
18R	G-Y	DTR	DCD	O	I	–	–	DTR	DCD

Table 30
NTAK02 connections at the cross-connect terminal — Port 3 (Part 2 of 2)

19T	Y-BR	DSR	CH/CI	I	O	I	O	DSR	CH/CI
19R	BR-Y	DCD	DTR	I	O	I	O	DCD	DTR
20T	Y-S	RTS	CTS	O	I	O	I	RTS	CTS
20R	S-Y	CTS	RTS	I	O	I	O	CTS	RTS
21T	V-BL	SCRA	SCTEA	I	O	I	O	SCR	SCT
21R	BL-V	SCTA	RXCA	I	O	I	O	SCT	–
22T	V-O	SCRB	SCTEB	I	O	–	–	–	–
22R	O-V	SCTB	RXCB	I	O	–	–	–	–
23T	V-G	RXDA	TXDA	I	O	I	O	RXD	TXD
23R	G-V	TXDA	RXDA	O	I	O	I	TXD	RXD
24T	V-BR	RXDB	TXDB	I	O	–	–	–	–
24R	BR-V	TXDB	RXDB	O	I	–	–	–	–
25T	V-S	–	–	–	–	–	–	SG	SG
25R	S-V	SG	SG	–	–	–	–	–	–

NTAK03 TDS/DTR card

The functionality of this card is incorporated into the design of the NDK20EA SSC card. Both cards, however, can exist simultaneously in a system.

An NTAK19EC cable is designed for use with the NTAK03 circuit card. However, an NE-A25B type 25-pair cable can be used to extend the connections to the cross-connect terminal. Table 31 on page 223 and Table 32 on page 223 show the connections for each port.

A modem eliminator is used to connect the RS232 converter cable and the NTAK19EC SDI cable to a terminal (not required when connecting to a modem).

> ***Note:*** A modem eliminator is supplied with the system.

Table 31
NTAK03 connections at the cross-connect terminal — Port 0

Pair	Color	Signal	Designations (I=input, O=output)
1T	W-BL	DSR	I
1R	BL-W	DCD	I
2T	W-O	–	–
2R	O-W	DTR	O
3T	W-G	RTS	O
3R	G-W	CTS	I
4T	W-BR	RX	I
4R	BR-W	TX	O
5T	W-S	SG	O
5R	S-W	–	–

Table 32
NTAK03 connections at the cross-connect terminal — Port 1

Pair	Color	Signal	Designations (I=input, O=output)
6T	R-BL	DSR	I
6R	BL-R	–	–
7T	R-O	–	–
7R	O-R	DTR	O
8T	R-G	RTS	O
8R	G-R	CTS	I
11T	BK-BL	RX	I
11R	BL-BK	TX	O
13T	BK-G	–	–
13R	G-BK	DCD	I
22T	V-O	SG	O
22R	O-V	–	–

Terminal setup

The terminal can be setup at any time, but it is not recommended that you do so during data transmission to avoid potential data loss.

Setup values are given in Table 34 on page 225, Table 35 on page 226 and Table 36 on page 227. Use the following procedure to set up the terminal.

Procedure 36
Setting up the terminal

1 **Turn on the power for the terminal.**

2 **Enter setup mode by pressing the <SETUP> key located on the top row of the special function keys.**

The current setup values are displayed.

3 **Change the value in each field on each setup screen as necessary.**

Use the following keys to view and change setup values:

Table 33
Setup (keys and functions)

Key	Function
Arrow key	Move from field to field
<Enter>	Scroll through possible values or cause requested action to take place (depends on type of field)
<Next Screen>	Move to next setup screen
<Prev Screen>	Move back to last screen

4 **Save changes by returning to the *General setup* screen, moving the cursor to the *Saved* field, and pressing *<Enter>*.**

Table 34
HP700/32 setup values

Global set-up screen			
Host Port	1	Keyboard	U.S.
Background	Dark	Message Translations	English
Screen Saver	10 Min	Setup Translations	English
Refresh Rate	72 Hz	Clear Display	
Key Click	Yes	Clear Comm	
User Set-up Screen			
Smooth Scroll	Jump scroll	Display Width	80
Cursor Type	Blink Line	Display Width Allowed	80 or 132
Cursor	Off	Char Cell Height	16
2nd Message Line	On	Clr on Width Change	Yes
Message Line	On	Aux Mode	Off
Status Line	On	Aux to Host	Off
On Line	Yes	Print Terminator=FF	No
Local Echo	Off	Logical Page Size	24
Auto Wrap	Off	Number of Pages	1
Auto Linefeed	Off		
Display Ctrl Codes	Off		
Emulation Set-up			
Emulation	VT320	Cursor Keys	Normal
Terminal Id	VT220	Print Scroll Region	Off
Control Codes	7-bit	User Features Locked	No
Characters Mode	8-bit	User Keys Locked	No
Preferred Char Set	DEC Supplemental	Data Procession Keys	No
Key Pad Mode	Application		
Port 1 Set-up			
Communications	Full Duplex	Limited Transmit	Off
Data Length	8-bits	DSRI	No
Parity	None	CTS	Ignore
Stop Bits	1	CD	Ignore
Xmit Baud	2400	Break Disconnect	170ms
RecvBaud	=Xmit	Disconnect Delay	Never
Xmit pace	Xoff	Aux printer Type	National
Recv Pace	Xoff at 128		
Port 2 Set-up			
Communications	Full Duplex	Xmit pace	Xon/Xoff
Data Length	8-bits	Recv Pace	Xoff at 128
Parity	None	Limited Transmit	Off
Stop Bits	1	Break Duration	170ms
Xmit Baud	9600	Aux Printer Type	National
RecvBaud	=Xmit		
Keyboard Set-up			
Lock Key	Caps Lock	Warning Bell	Yes
Kbd Lock Enable	Yes	Auto Answerback	Yes
Save Tabs	Yes	Answerback =	
Auto Repeat	Yes	Conceal Answerback	No
Margin Bell	Yes	Do not set any tabs or programmed keys.	

Table 35
VT420 setup values

Global Set-Up
On Line
Sessions on Comm1
CRT Saver
Comm1=RS232
Printer Shared
70Hz

Display Set-Up
80 Columns
Interpret Controls
Auto Wrap
Jump Scroll
Dark Screen
Cursor
Block Style Cursor
No Status Display
Cursor Steady
3x24 pages
24 Lines/Screen
Vertical Coupling
Page Coupling
Auto Resize Screen

General Set-up
VT400 Mode, 7-bit Controls
User Defined Keys Unlocked
User Features Unlocked
8-bit Characters
Application Keypad
Normal Cursor Keys
No New Line
UPSS DEC Supplemental
VT420 ID
When Available Update

Communications Set-Up
Transmit=2400
Receive=Transmit
Xoff=64
8bits, No Parity
1 Stop Bit
No Local Echo
Data Leads Only
Disconnect, 2 s Delay
Limited Transmit
No Auto Answerback
Answerback=
Not Concealed
Modem High Speed = ignore
Modem Low Speed = ignore

Printer Set-Up
Speed=2400
No printer to Host
Normal Print Mode
XOFF
8bits, No Parity, 1 Stop bit
Print Full Page
Print National Only
No Terminator

Keyboard Set-up
Keyboard Set-up
Typewriter Keys
Caps Lock
Auto Repeat
Keyclick High
Margin Bell
Warning Bell High
Character Mode
<X] Delete
Local Compose
Ignore Alt
F1 = Hold
F2 = Print
F3 = Set-Up
F4 = Session
F5 = Break
,< and .> Keys
<> Key
‘~Key

Tab Set-Up
Leave this screen at the default values

Table 36
VT220 setup values

Global Set-Up	
On Line	Comm1=RS232
Sessions on Comm1	70Hz
CRT Saver	Printer Shared
Display Set-Up	
80 Columns	Light Text, Dark Screen
Interpret Controls	Cursor
Auto Wrap	Block Style Cursor
Jump Scroll	
General Set-up	
VT200 Mode, 7-bit Controls	Application Keypad
User Defined Keys Unlocked	Normal Cursor Keys
User Features Unlocked	No New Line
Multinational	
Communications Set-Up	
Transmit=2400	No Local Echo
Receive=Transmit	Data Leads Only
Xoff at 64	Disconnect, 2 s Delay
8bits, No Parity	Limited Transmit
1 Stop Bit	
Printer Set-Up	
Speed=9600	
Normal Print Mode	Print Full Page
8bits, No Parity,	Print National Only
1 Stop bit	No Terminator
Keyboard Set-up	
Typewriter Keys	Warning Bell
Caps Lock	Break
Auto Repeat	Answerback=
Keyclick High	Not Concealed
Margin Bell	
Tab Set-Up Screen	
Leave this screen at the default values	

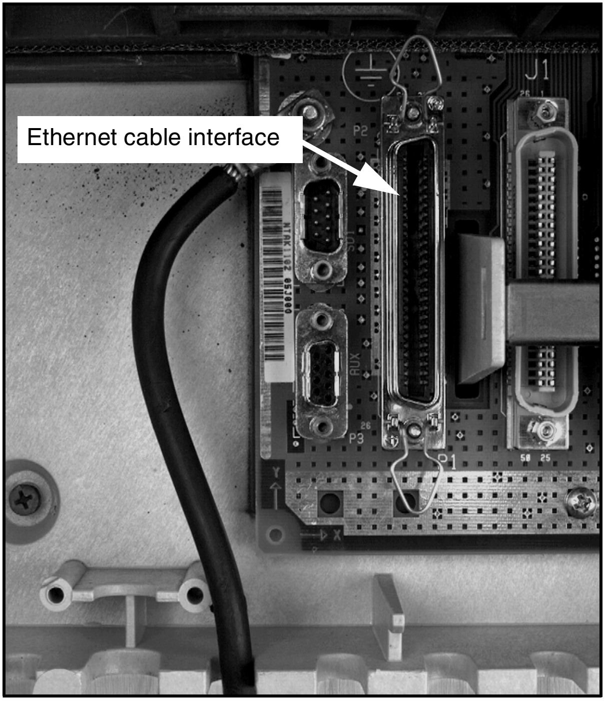
Installing and connecting an ethernet cable

IP expansion 10BaseT port

The Option 11C system provides one 10 Mbps Ethernet connection to a Local Area Network (LAN). The Ethernet cable connector is located just left of the retaining bar in the main and IP expansion cabinets as shown in Figure 91 on page 228. The 10BaseT Ethernet port available on the SSC of an IP Expansion cabinet is functional. However, the Ethernet port on the IP Expansion cabinet does not have a default IP configuration. This means that the IP port configuration must be performed before it can be used.

It is not recommended to use the remote 10BaseT port in normal mode as maintenance or alarm management are not available. In survival mode it assumes the system level configuration of the main cabinet port.

Figure 91
Ethernet port location



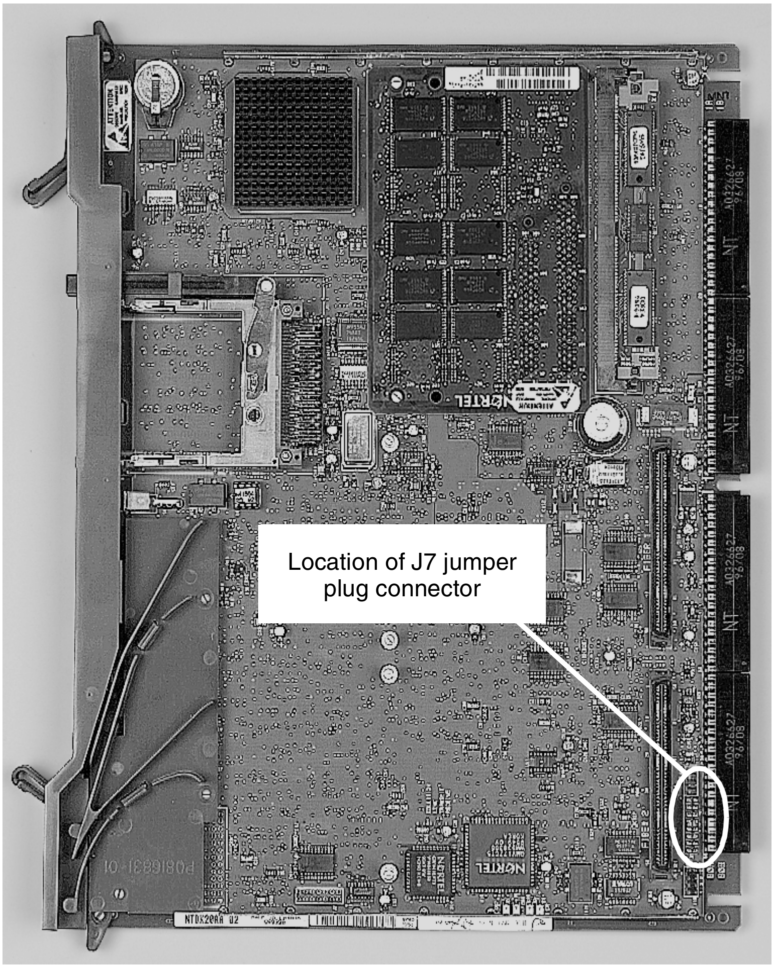
Note: An Ethernet connection is not available on systems equipped with an NTDK26 Backwards Compatible Daughterboard on the NDK20EA SSC card (usually two-cabinet systems interconnected with copper cable).

J7 Jumper plug

The J7 jumper plug must be in place on the NDK20EA SSC card for the Ethernet function to operate. The jumper plug is present when the NDK20EA SSC card is shipped. However, it must be removed to accommodate the NTDK26 Backwards Compatible Daughterboard used in multi-cabinet systems that are not interconnected with fiber optic cable.

When a multi-cabinet system is upgraded from copper to fiber optic cable inter-cabinet connections, the NTDK26 Backwards Compatible Daughterboard must be replaced with fiber expansion daughterboards. The J7 jumper plug must be installed at the same time if the Ethernet capability is required. See Figure 92 on page 230.

Figure 92
J7 Jumper Plug location on NDK20EA SSC card


Location of J7 jumper plug connector

Procedure 37
Connecting the Ethernet cable

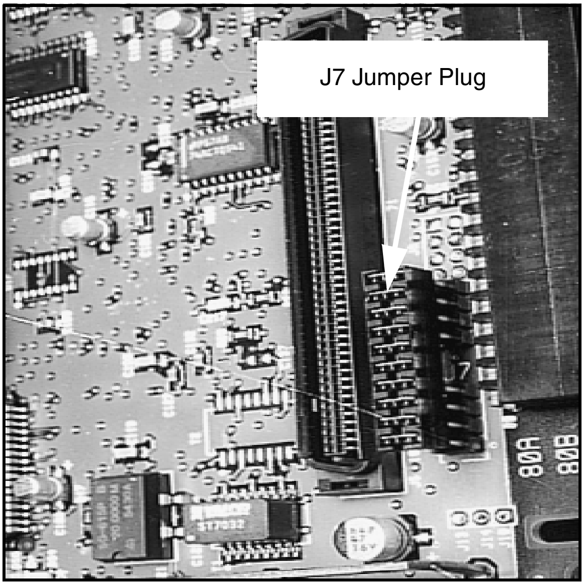
1 **Insert the 50-pin end of the cable into the cable connector on the left side of the retaining bar as shown below.**

2 **Route the cable through the fifth cable groove from the left side.**

The ethernet cable is a 50-pin amphenol to 15-pin AUI adaptor cable (Part number for ethernet cable NTDK27 A06030723). This provides a standard MAU attachment point.

Note: A jumper block located on connector J7 (near the Fiber 2 connector) (see Figure 92 on page 230 and the following figure) on the component side of the NDK20EA SSC card must be in place for the Ethernet connection to function. The NDK20EA SSC card is normally shipped with the plug installed. If the Ethernet connection does not appear to function properly, check the jumper plug to make sure that it is installed.

Figure 93
Connector J7



3 **If not previously done, configure the ethernet port in software as described in *Maintenance*** (553-3001-511)**.**

System software installation

Contents

This section contains information on the following topics:

Reference list 233

General information 233

General information 243
  Keycode Information 233
  How to install software in a new system 234
  Software installation on the IP Expansion Cabinet using the preprogrammed software daughterboard 244

Reference list

The following are the references in this section:

- *Option 11C and 11C Mini Fault Clearing* (553-3011-500)
- *Maintenance* (553-3001-511)

General information

This Chapter describes how to install software in a new Option 11C system.

Before continuing with the procedures outlined in this Chapter, verify that all pertinent hardware is either connected to, or installed in the system.

Keycode Information

Data you need to enter during the software installation is provided on the Keycode Datasheet.

If the keycodes are unsuccessful, check the following:

- software issue
- feature set name
- any additional packages
- TNs
- ISM parameters
- security ID
- auxiliary ID (the old site ID, if this is an upgrade)
- ensure the correct keycodes were entered. All items must match the Keycode Datasheet exactly.

For an Option 11C Mini system, check that the number of TNs has been entered correctly from the keycode sheet.

When performing a new system installation, please ensure that the default AUX ID matches the AUX ID from the Keycode Datasheet.

If they still are not successful, then call your Service Representative.

How to install software in a new system

Summary of steps

The Software Installation steps are summarized in the following list:

- Get MAC address from IP daughterboard
- Power up/Install IP Expansion cabinet
- Power up Main cabinet. Ensure link led is green
- Perform software installation on the Main cabinet
- Select the New System Installation menu
- Select Feature Set and packages
- Select a database
- Select Incremental Software Management (ISM) parameters. Ensure Survivability parameter is configured correctly
- Configure MAC addrress of the IP Expansion cabinet

- Validate keycodes
- Set the system time and date
- Reboot the Main cabinet
- Wait for link to come up.

Note: IP expansion cabinet software must be the same software version as the main Option 11C cabinet.

CAUTION

Wear the antistatic wrist strap provided in the bottom of the cabinet before handling circuit cards. Static electricity can damage the components of power supplies and circuit cards.

Procedure 38
Installing the software

Note: This procedure assumes that the system installation procedures in Chapter 8 have been performed and that the system is up and running. The Link LED on the software daughterboards should be lit and green.

1 Observe the terminal screen.

If the following is displayed:

```
SOFTWARE INSTALLATION PROGRAM
```

proceed to Step 3.

If the following is displayed:

```
current system time and date: 00:00:00 -- 00/00/00
```

proceed to Step 2.

If neither message appears, refer to the *Option 11C and 11C Mini Fault Clearing* (553-3011-500).

2 Set the system time and date.

Note: The Time and Date prompt appears only when the Install Setup Program detects a system Year Date that is not in the range of 1995-2095. The responses shown below are examples of how to enter the system Time and Date:

```
Enter new time (hh/mm/ss)
08:00:00 <cr>
Enter new date (yy/mm/dd)
95/05/01 <cr>
08:00:00 -- 95/05/01 is the new system time and date

y <cr>
```

3 Select Menu option 1 for a new installation.

```
Main Cabinet Software Installation Main Menu:

1. New Install or Option 11/11E Upgrade - From Software Daughterboard
2. System Upgrade
3. Utilities
4. New System Installation - From Software Delivery Card

[q]uit, [p]revious, [m]ain menu, [h]elp or [?], <cr> - redisplay

Enter selection: 1<cr>

Meridian 1 Software Rls (25.40) will be installed.
```

Note: The following prompts require information from the Keycode data sheet. Please have it available.

4 Select the Feature Set to be enabled.

Note: The Feature Set selected must match the ones provided with key codes on the keycode data sheet. The Feature Set names shown below are examples only.

```
Select Feature Set You Wish to Enable:
1. General Business (NTSKxxxx)
2. Enhanced Business (NTSKxxxx)
3. Enterprise (NTSKxxxx)
4. NAS/VNS (NTSKxxxx)
[q]uit, [p]revious, [m]ain menu, [h]elp or [?], <cr> redisplay
```

(example only:)

```
Enter Selection: 2 <cr> (Enhanced Business)
```

5 Indicate whether or not packages are to be added.

```
Feature Set Selection: Enhanced Business

Do you wish to add packages?
Select no, yes or abort:
n <cr> (no)
y <cr> (yes)
a <cr> (abort)
```

Note: Abort returns you to the main menu.

If the response was **NO** go to Step 8 on page 238.
If the response was **YES** go to Step 6 on page 237.

6 Select the Feature packages to be added.

```
Summary of Packages selected is:
0-2 4-5 7-14 16-25 28-29 32-64 67 70-77 79-83 86-93 95 98-104
107-111 113-116 118-120 122-125 127-129 131-133 135 137-141 167
Enter packages (s) to be added, blank line to end:
215-235 <cr>
```

Note: (<cr> ends selection entry or if no packages are to be added).

7 Confirm Feature Set and packages.

```
Your Feature Set Selection is “Enhanced Business”:
Additional Packages selected: 215-235
Summary of Packages selected is:
0-2 4-5 7-14 16-25 28-29 32-64 67 70-77 79-83 86-93 95 100-104 107-111
113-116 118-120 122-125 127-129 131-133 135 137-141 167
...
...
215-235

Is this selection correct?
n <cr> (no)
y <cr> (yes)
a <cr> (abort, return to main menu)
```

If the response was **NO** go to Step 4 on page 236.
If the response was **YES** go to Step 8 on page 238.

8 Select a Database.

Select menu option 1 or 2 for a new system installation:
1. Pre-Configured database - Enhanced Business
2. Basic Configuration (Release 22)
3. CCBR Restore File
4. Option 11/11E Software Cartridge
[q]uit, [p]revious, [m]ain menu, [h]elp or [?], <cr> redisplay

Enter Selection: 1 <cr>.

9 Confirm database selection.

Do you wish to continue?
n <cr> (no)
y <cr> (yes)
a <cr> (abort, return to main menu)

If the response was **No, go to Step 8 on page 238**.
If the response was **YES, go to Step 10 on page 238**.

10 Review ISM parameters.

Note: On a new installation, the ISM parameters displayed on the terminal screen will be the default settings associated with the Feature Set selection. These settings can be accepted without changes or changed to suit the requirements of the new system.

Example: Current ISM Parameters:		**Parameter Description**
TNS	(100)	**maximum number of terminal numbers**
ACDN	(300)	**maximum number of ACD DNs**
AST	(100)	**(maximum number of associate Sets**
LTID	(100)	**maximum number of Logical Terminal IDs**
RAN CON	(12)	**default RAN connection**
RAN RTE	(2500)	**default RAN routes**
MUS CON	(100)	**default MUS connection)**
BRAND	(0)	**brandline**
ACD AGENTS	(300)	**maximum number of ACD agents**
ANALOGUE TELEPHONES	(2500)	**maximum number of analogue sets**
ATTENDANT CONSOLES	(2500)	**maximum number of attendant sets**
BRI DSL	(100)	**maximum number of Digital Subscriber Loops**
CLASS TELEPHONES	(2500)	**maximum number of class sets**

DATA PORTS	(2500)	**maximum number of data ports**
DIGITAL TELEPHONES	(2500)	**maximum number Digital sets**
INTERNET TELEPHONES	(0)	**maximum number of Internet sets**
PHANTOM PORTS	(2500)	**maximum number of phantom ports**
WIRELESS TELEPHONES	(2500)	**maximum number Wireless sets**
WIRELESS VISITORS	(0)	**maximum number Wireless Visitors**
ITG ISDN TRUNKS	(2500)	**maximum number ISDN trunks**
TRADITIONAL TRUNKS	(2500)	**maximum number of traditional trunks**
TMDI D-CHANNELS	(100)	**maximum number of channels**
SURVIVABILITY	(0)	**Number of Survivable IP expansion cabinets**

Do you wish to change ISM parameters?
n <cr> (no change)
y <cr> (change)
a <cr> (abort, return to main menu)

If the response was **YES** go to Step 11 on page 239.
If the response was **NO** go to Step 12 on page 241.

11 Select ISM parameters.

```
Do you wish to change any ISM parameters? (y/n/[a]bort): y

Enter new ISM parameters, <cr> to leave unchanged:

TNS                         (100) 200
ACDN                        (300)
AST                         (100)
LTID                        (100)
RAN CON                     (12)
RAN RTE                     (2500)
MUS CON                     (100)
BRAND                       (0)
ACD AGENTS                  (300)
ANALOGUE TELEPHONES         (2500)
ATTENDANT CONSOLES          (2500)
BRI DSL                     (100)
CLASS TELEPHONES            (2500)
```

```
DATA PORTS                    (2500)
DIGITAL TELEPHONES            (2500)
INTERNET TELEPHONES           (0)
PHANTOM PORTS                 (2500)
WIRELESS TELEPHONES           (2500)
WIRELESS VISITORS             (0)
ITG ISDN TRUNKS               (2500)
TRADITIONAL TRUNKS            (2500)
TMDI D-CHANNELS               (100)
SURVIVABILITY                 (0) 4

Confirm ISM parameters.

New ISM parameters are:

TNS                           (200)
ACDN                          (300)
AST                           (100)
LTID                          (100)
RAN CON                       (12)
RAN RTE                       (2500)
MUS CON                       (100)
BRAND                         (0)
ACD AGENTS                    (300)
ANALOGUE TELEPHONES           (2500)
ATTENDANT CONSOLES            (2500)
BRI DSL                       (100)
CLASS TELEPHONES              (2500)
DATA PORTS                    (2500)
DIGITAL TELEPHONES            (2500)
INTERNET TELEPHONES           (0)
PHANTOM PORTS                 (2500)
WIRELESS TELEPHONES           (2500)
WIRELESS VISITORS             (0)
ITG ISDN TRUNKS               (2500)
TRADITIONAL TRUNKS            (2500)
TMDI D-CHANNELS               (100)
SURVIVABILITY                 (4)
```

Is this correct?
n <cr> (no)
y <cr> (yes)
a <cr> (abort, return to main menu)

If the response was **NO** go to Step 10 on page 238.
If the response was **YES** go to Step 12 on page 241.

12 Define the AUX ID.

Note: The default AUX ID is the security ID provided with the Option 11C. It should be replaced with the previous Option 11 or Option 11E site ID.

Example:

Security ID: 10000326
Current AUX ID: 10000326
Do you wish to change the AUX ID?

y <cr> (yes)
n <cr> (no)
a <cr> (abort, return to main menu)

If the response was **NO** go to Step 14 on page 242.
If the response was **YES** go to Step 13 on page 241.

13 Enter the AUX ID.

Enter the Option 11/11E Security ID for the new AUX ID,

<cr> to maintain
12121212 <cr>

New AUX ID: 12121212

Is this correct?
y <cr> (yes)
n <cr> (no)
a <cr> (abort, return to main menu)

If the response was **NO** go to Step 12 on page 241.
If the response was **YES** go to Step 14 on page 242.

14 Review and confirm information entered.

```
New Installation Information Summary:
Security ID         : xxxxxxxx
Aux ID              : xxxxxxxx
Cabinet Type        : MAIN
Feature Set         : Enhanced Business
Additional Pkgs     : 215-235
Database            : Company ABC
                       OLD     NEW
S/W Release         :  2520F   2520X
ISM Parameters

TNS                                 200 200
ACDN                                300 300
AST                                 100 300
LTID                                100 100
RAN CON                             12 12
RAN RTE                             2500 2500
MUS CON                             100 100
BRAND                               0 0
ACD AGENTS                          300 300
ANALOGUE TELEPHONES                 2500 2500
ATTENDANT CONSOLES                  2500 2500
BRI DSL                             100 100
CLASS TELEPHONES                    2500 2500
DATA PORTS                          2500 2500
DIGITAL TELEPHONES                  2500 2500
INTERNET TELEPHONES                 0 0
PHANTOM PORTS                       2500 2500
WIRELESS TELEPHONES                 2500 2500
WIRELESS VISITORS                   0 0
ITG ISDN TRUNKS                     2500 2500
TRADITIONAL TRUNKS                  2500 2500
TMDI D-CHANNELS                     100 100
SURVIVABILITY                       4 4

Is this correct?
y <cr> (yes)
n <cr> (no)
a <cr> (abort, return to main menu)
```

If the response was **NO** go to Step 4 on page 236.
If the response was **YES** go to Step 15 on page 243.

15 Enter the keycodes

Note: See Keycode Information on page 233 for important information on Keycodes.

```
Enter new Keycodes:

Example:
Key 1:
Key 2:
Key 3:

xxxxxxxx <cr>
yyyyyyyy <cr>
zzzzzzzz <cr>

Keycode validation successful.
```

WARNING A system restart will be invoked as part of the software installation process.

If the **successful** message appears go to Step 16 on page 243.

If the **unsuccessful** message appears, repeat this step, Step 15 on page 243.

After three unsuccessful keycode validation attempts, the following message appears:

```
Keycode validation unsuccessful.
Installation aborted...returning to main menu.
```

16 Complete the software installation.

```
Are you sure you wish to perform the installation?
y <cr> (yes)
n <cr> (no)
a <cr> (abort, return to main menu)
```

If the response was **No** go to Step 3 on page 236.
If the response was **YES** this is the end of the software installation program. Continue with the next step, Step 17 on page 243.

17 Observe the screen a second time once the installation program has been completed.

Messages will appear on the TTY or terminal screen. When the message “INIXXX” appears, the system is operational.

18 Perform an EDD using LD 43. Refer to *Maintenance* (553-3001-511) for further information on LD 43.

19 **Configure the IP Daughterboards' MAC and IP addresses**. Refer to LD 117 in *Maintenance* (553-3001-511).

——————————— *End of Procedure* ———————————

Software installation on the IP Expansion Cabinet using the preprogrammed software daughterboard

Point-to-Point or Layer 2 with bootp configuration

For Point-to-Point or Layer 2 with bootp configuration, you do not need a TTY connected to the IP Expansion Cabinet. Power up the system, and the software installs automatically.

Layer 2 or Layer 3 with manual configuration

IMPORTANT

BootP is a broadcast message used for IP Address discovery.

- For Point-to-Point installation, you must select Option 1.
- For Layer 2 LAN installation, the recommended selection is Option 1.
- For Layer 3 LAN installation, you must select Option 2.

Procedure 39
Software installation for IP expansion, using the preprogrammed software daughterboard

Note: This procedure is performed from a TTY connected to the IP Expansion Cabinet.

1 Power up the system, and the menu in Step 2 appears.

2 Select Manual Configuration (item 2) from the IP Expansion Cabinet Configuration Menu.

The IP Configuration Menu is displayed:

```
IP Configuration Menu:
```

```
1. Automatically Using BootP
2. Using Manual Configuration
3. Keep Existing Configuration
[q]uit, [p]revious, [m]ain menu, [h]elp or [?], <cr>
- redisplay
```

Enter Selection: 2

3 Configure IP Expansion Parameters.

For the following menu, the sample IP parameters will be used:

IP address of the expansion cabinet 100BaseT(F): 47.147.20.101;
Subnet Mask of the expansion cabinet 100BaseT(F): 255.255.255.0;
Gateway address: 47.147.20.1;
IP address of the main cabinet 100BaseT(F): 47.147.10.100.

The IP Parameters menu is displayed:

```
Enter Expansion New IP Parameters:
Expansion IP: 47.147.20.101
Expansion NetMask: 255.255.255.0
Main IP: 47.147.10.100

Expansion Router/Gateway: 47.147.20.1

Is this correct? (t/n/[a]bort): Y
```

Note: ‘Expansion Router/Gateway’ appears only in a Layer 3 configuration.

4 The software installation is completed automatically without user intervention.

5 Refer to *Software Input/Output Guide Maintenance* (553-3001-511) LD 117 to configure the IP Expansion cabinets IP Address.

——————————— ***End of Procedure*** ———————————

Connecting the telephones

Contents

This section contains information on the following topics:

Reference list 247
General information 248
Cross-connecting telephones 249
Connecting telephones without a PFTU 251
Connecting 500/2500-type telephones with a PFTU 252
Connecting off-premise telephones 253
Connecting an attendant console 255
Cross-connecting terminal Digital Subscriber Loops 269
Activating telephones 269
Activating a default model with a character display 270
Activating a default model without a character display 272
Activating a customized model with a character display 273
Activating a customized model without a character display 275
Activating terminals on a DSL 276

Reference list

The following are the references in this section:

- *Telephone and Attendant Console: Installation* (553-3001-215)
- *Software Input/Output Guide Maintenance* (553-3001-511)
- *Option 11C ISDN BRI Hardware Installation and Maintenance* (553-3011-311)

General information

This chapter contains instructions for connecting telephones to the cross-connect terminal. It also contains the location of the individual extension numbers (DNs) when you are implementing one of the default numbering plans and how to activate each telephone.

Refer to the instructions provided with the telephone or console and to *Telephone and Attendant Console: Installation* (553-3001-215) for detailed information about installing telephones and consoles.

The cable from the cabinet card slot containing the line card associated with the telephone being connected, must be installed before you continue. Refer to "Installing and connecting cross-connect terminals to cabinets" on page 169, if additional cabling is required.

Cable assignments

The cables from each cabinet are labeled J1 through J10 at the cross-connect terminal. Each cable represents a specific set of Terminal Numbers (TNs) as shown in Table 37 on page 258.

WARNING

Always use caution when installing or modifying telephone lines. Avoid installing telephone wiring during a lightning storm. Do not install telephone jacks in wet locations unless the jack is specifically designed for wet locations. Never touch uninsulated telephone wiring unless the line has been disconnected at the network interface.

Cross-connecting telephones

Connect the telephones according to the following figures. Cross-connections for Analog (500/2500 type) telephones are shown in Figure 94 on page 250, and for Meridian Digital Telephones in Figure 95 on page 251.

Procedure 40
Cross-connecting telephones

1. **Locate telephone terminations at the cross-connect terminal.**
2. **Connect Z-type cross-connecting wire to the leads of the telephone.**
3. **Locate line circuit card (TN) terminations at the cross-connect terminal.**
4. **Connect the other end of the cross-connecting wire to the assigned TN terminal block.**

Figure 94
NE-500/2500-type telephone cross-connections

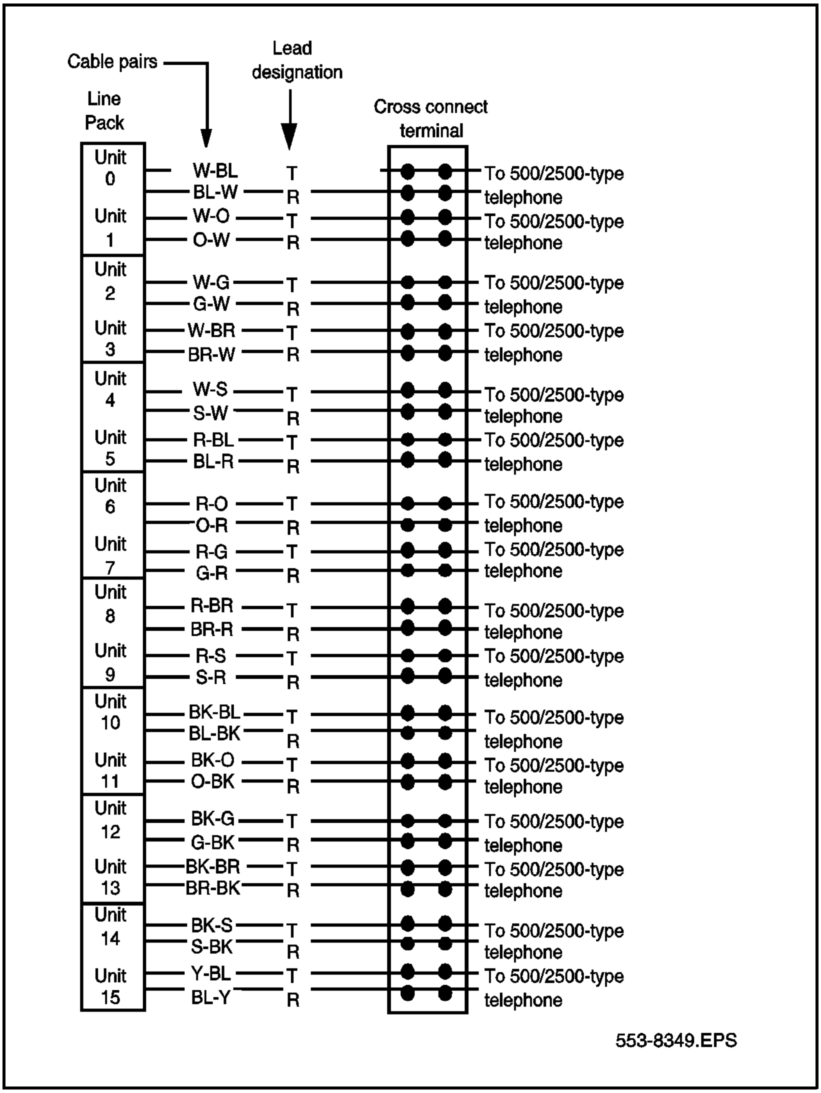
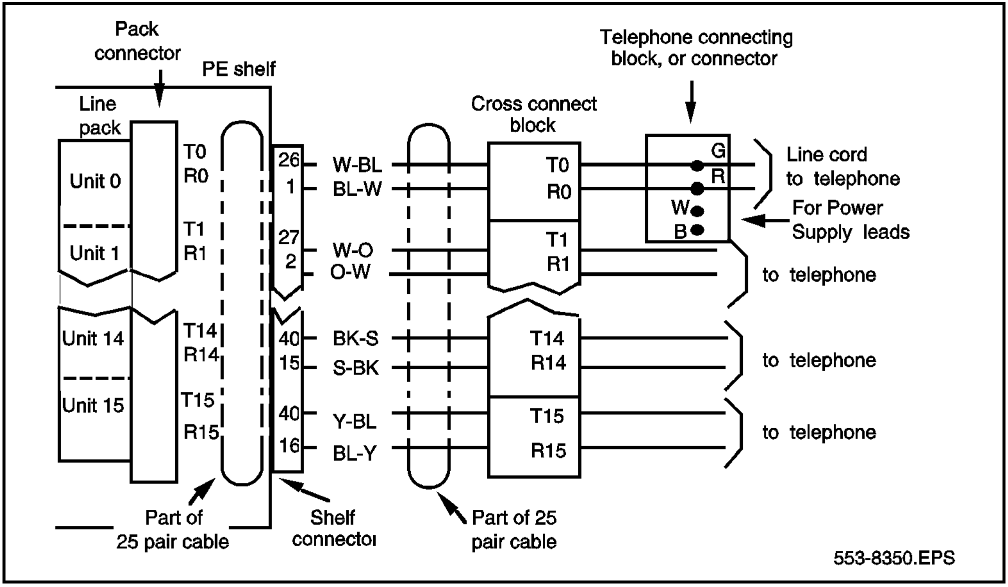

Cable pairs
Lead designation
Line Pack
Cross connect terminal
Unit 0
Unit 1
Unit 2
Unit 3
Unit 4
Unit 5
Unit 6
Unit 7
Unit 8
Unit 9
Unit 10
Unit 11
Unit 12
Unit 13
Unit 14
Unit 15
W-BL T
BL-W R
W-O T
O-W R
W-G T
G-W R
W-BR T
BR-W R
W-S T
S-W R
R-BL T
BL-R R
R-O T
O-R R
R-G T
G-R R
R-BR T
BR-R R
R-S T
S-R R
BK-BL T
BL-BK R
BK-O T
O-BK R
BK-G T
G-BK R
BK-BR T
BR-BK R
BK-S T
S-BK R
Y-BL T
BL-Y R
To 500/2500-type telephone
553-8349.EPS

Figure 95
Meridian Digital Telephone cross-connections


Pack connector
PE shelf
Line pack
Unit 0
Unit 1
Unit 14
Unit 15
T0
R0
T1
R1
T14
R14
T15
R15
26
1
27
2
40
15
40
16
W-BL
BL-W
W-O
O-W
BK-S
S-BK
Y-BL
BL-Y
Cross connect block
T0
R0
T1
R1
T14
R14
T15
R15
Telephone connecting block, or connector
G
R
W
B
Line cord to telephone
For Power Supply leads
to telephone
to telephone
to telephone
Part of 25 pair cable
Shelf connector
Part of 25 pair cable
553-8350.EPS

Connecting telephones without a PFTU

Procedure 41
Connecting telephones without a PFTU

1 **Locate the telephone terminations on the cross-connect terminal.**

2 **Connect one end of the cross-connect wire to the leads of the telephone.**

3 **Locate the line card terminations on the cross-connect terminal.**

Refer to Table 37 on page 258 and Table 38 on page 259.

4 **Connect the other end of the cross-connect wire to the assigned TN terminal block.**

Default DN assignments are given in the following Tables:

- Table 42, “Main Cabinet Default DN assignments,” on page 263
- Table 43, “Expansion Cabinet 1 Default DN assignments,” on page 264

- Table 44, “Expansion Cabinet 2 Default DN assignments,” on page 265
- Table 45, “Expansion Cabinet 3 Default DN assignments,” on page 267
- Table 46, “Expansion Cabinet 4 Default DN assignments,” on page 268

The telephone can now be activated as described in “Activating telephones” on page 269.

Note: All the following tables show the **default** DNs.

Connecting 500/2500-type telephones with a PFTU

Procedure 42
Connecting 500/2500-type telephones with a PFTU

1 **Locate the telephone terminations on the cross-connect terminal.**

2 **Connect one end of the cross-connect wire to the leads of the telephone.**

3 **Locate the PFTU connections (unit PFT 1 through PFT 5) assigned to this telephone at the cross-connect terminal.**

Refer to Table 39 on page 261 and Table 40 on page 262.

4 **Connect the other end of the cross-connect wire to the pair assigned to the telephone on the PFTU.**

5 **Connect a second cross-connect wire to the pair assigned to the line card on the PFTU.**

6 **Locate the line card terminations on the cross-connect terminal.**

Refer to Table 37 on page 258 for the Main cabinet and Expansion cabinets 1 and 2.

Refer to Table 38 on page 259 for Expansion cabinets 3 and 4.

7 **Connect the other end of the cross-connect wire to the assigned TN terminal block.**

Default DN assignments are given in the following Tables:

- Table 42, “Main Cabinet Default DN assignments,” on page 263

- Table 43, "Expansion Cabinet 1 Default DN assignments," on page 264
- Table 44, "Expansion Cabinet 2 Default DN assignments," on page 265
- Table 45, "Expansion Cabinet 3 Default DN assignments," on page 267
- Table 46, "Expansion Cabinet 4 Default DN assignments," on page 268

The telephone can now be activated as described in "Activating telephones" on page 269.

Connecting off-premise telephones

Off-premise 500/2500-type telephones must be connected through an NTAK92AA Off-Premise Protection module. Each module can connect up to four analog telephones and can interface with an NT1R20 Off-Premise Station analog Line Card, an NT8D03 Analog Line Card or with an NT8D09 Message Waiting Line Card.

WARNING

The message waiting line card produces -150 volts which is considered hazardous on off-premise telephones. Make sure that the -150 V is disabled on off-premise telephones.

The voltage is disabled when the Class Of Service (CLS) assigned to the telephone is LPD (message waiting lamp denied) and MWD (Message Waiting Denied) in LD 10.

Refer to *Software Input/Output Guide Maintenance* (553-3001-511) for information about LD 10.

Under no circumstances shall LPA or MWA be assigned in the Class of Service on off-premise telephones.

Procedure 43
Connecting an off-premise telephone

1 **Mount the NTAK92AA Off-Premise protection module on the wall using four #10 1/2 in (minimum) screws.**

2 **Connect a #6 AWG (#40 Metric Wire Gauge) from the ground lug at the bottom of the NTAK92AA Off-Premise protection module to an earth ground.** Refer to Figure 96 on page 256**.**

WARNING

If connecting to a message waiting line card, unseat the card from its assigned slot before proceeding with the next step.

3 **Connect two NTAK9204 cables (one from connector J1 and one from connector J2) from the protection module to the cross-connect terminal.**

Terminate the cables as shown in Figure 94 on page 250.

4 **Cross-connect the J1 cable to the Tip and Ring connections coming from the line card.**

Default DN assignments are given in the following Tables:

- Table 42, “Main Cabinet Default DN assignments,” on page 263
- Table 43, “Expansion Cabinet 1 Default DN assignments,” on page 264
- Table 44, “Expansion Cabinet 2 Default DN assignments,” on page 265
- Table 45, “Expansion Cabinet 3 Default DN assignments,” on page 267
- Table 46, “Expansion Cabinet 4 Default DN assignments,” on page 268

5 **Cross-connect the J2 cable to the off-premise telephone.**

6 **Install the regulatory label provided with the Off-Premise protection module on the inside right-hand wall of the cabinet near the velcro wriststrap fastener.**

7 **Install the line card in its assigned position.**

The telephone can now be activated as described in “Activating telephones” on page 269.

Connecting an attendant console

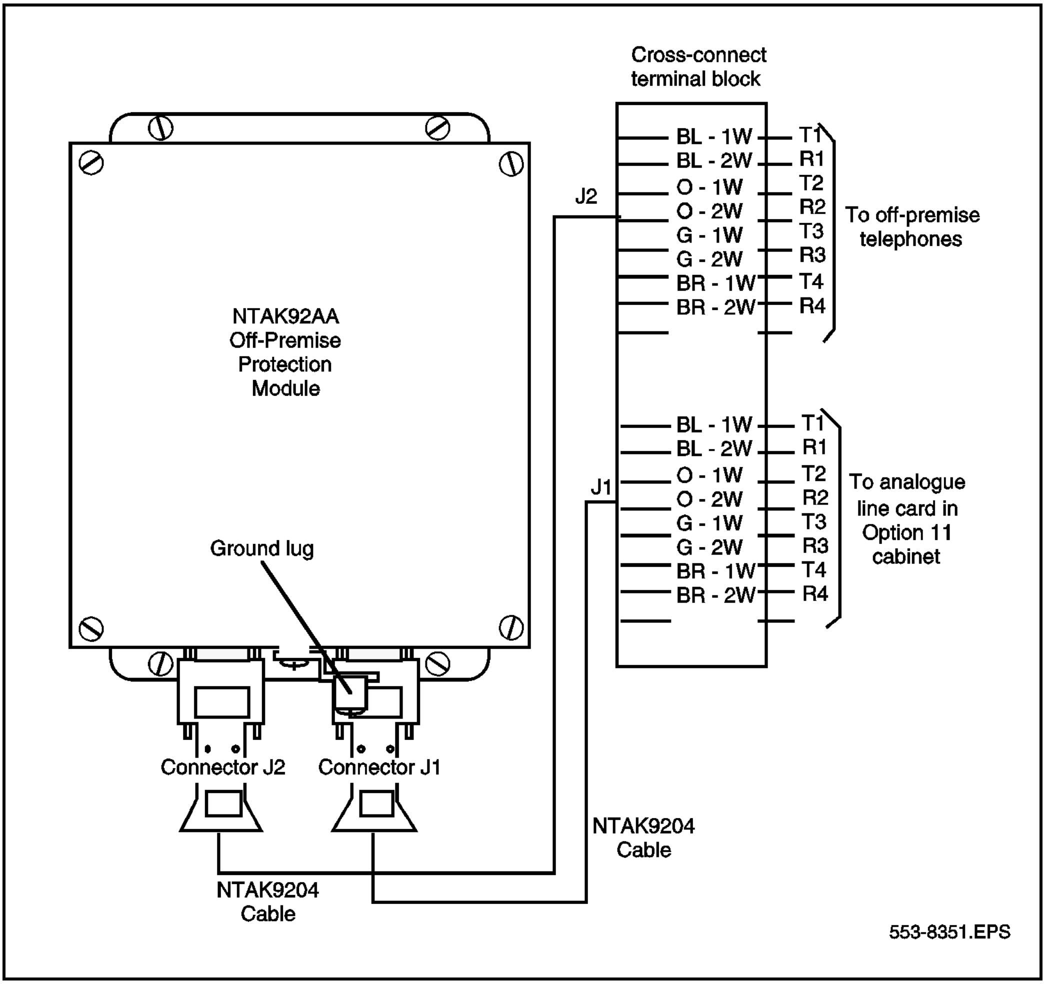
Procedure 44
Connecting attendant console

1 **Locate the attendant console terminations at the cross-connect terminal.**

2 **Locate the line card terminations at the cross-connect terminal.**

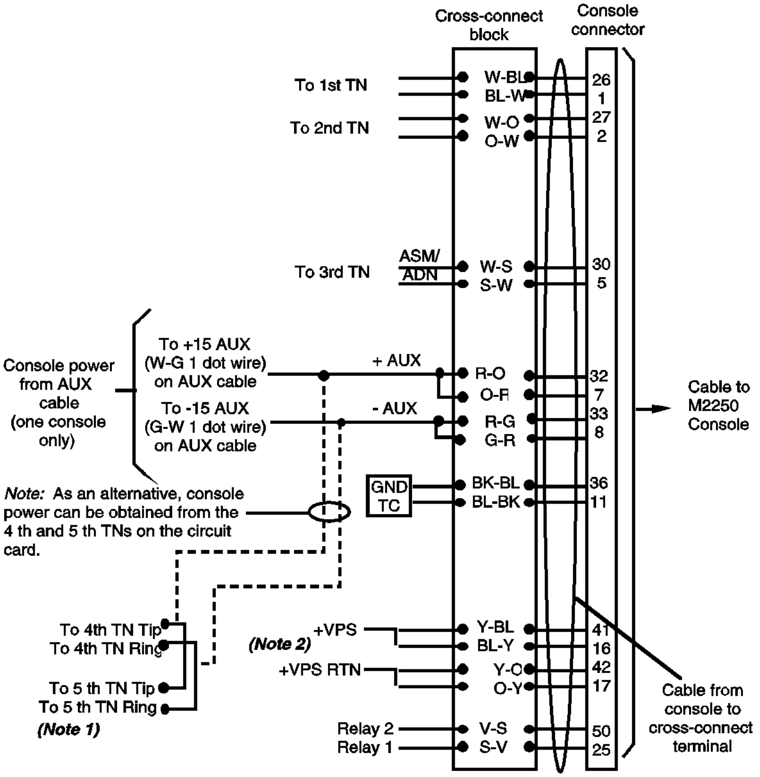
3 **With cross-connect wire, connect the line card and other connections to the console as shown in Figure 97 on page 257.**

Figure 96
NTAK92AA Off-Premise Protection Module connections



Cross-connect terminal block
BL - 1W
BL - 2W
O - 1W
O - 2W
G - 1W
G - 2W
BR - 1W
BR - 2W
T1
R1
T2
R2
T3
R3
T4
R4
To off-premise telephones
J2
NTAK92AA Off-Premise Protection Module
BL - 1W
BL - 2W
O - 1W
O - 2W
G - 1W
G - 2W
BR - 1W
BR - 2W
T1
R1
T2
R2
T3
R3
T4
R4
To analogue line card in Option 11 cabinet
J1
Ground lug
Connector J2
Connector J1
NTAK9204 Cable
NTAK9204 Cable
553-8351.EPS

Figure 97
Attendant console connections


Cross-connect block
Console connector
To 1st TN
To 2nd TN
W-BL
BL-W
W-O
O-W
26
1
27
2
To 3rd TN
ASM/
ADN
W-S
S-W
30
5
Console power from AUX cable (one console only)
To +15 AUX (W-G 1 dot wire) on AUX cable
+ AUX
To -15 AUX (G-W 1 dot wire) on AUX cable
- AUX
R-O
O-R
R-G
G-R
32
7
33
8
Cable to M2250 Console
Note: As an alternative, console power can be obtained from the 4 th and 5 th TNs on the circuit card.
GND
TC
BK-BL
BL-BK
36
11
To 4th TN Tip
To 4th TN Ring
To 5 th TN Tip
To 5 th TN Ring
(Note 1)
+VPS
(Note 2)
+VPS RTN
Y-BL
BL-Y
Y-O
O-Y
41
16
42
17
Cable from console to cross-connect terminal
Relay 2
Relay 1
V-S
S-V
50
25

Note 1: The M2250 is powered via the line circuits and if required from the AUX cable. In addition to the primary TN, secondary TN and ASMTN, two TNs are or power from the AUX cable are cabled to the M2250 through the + AUX and - AUX leads. Maximum loop length is 3000 ft (915 m) of 24 AWG (5.0 Metric Wire Gauge).

Note 2: When additional options are used (BLF) an additional 16V dc power supply is required. The 16V dc source is cabled through +VPS and +VPS RTN leads. The maximum distance from the console to the power source is 120 ft (36 m) of 24 AWG (5.0 Metric Wire Gauge) wire.

553-8352.EPS

Table 37
Terminal number assignments — Main and Expansion Cabinets 1 and 2 (Part 1 of 2)

Card	First TN......Last TN	Cable	Cabinet
1	01 00......01 15	J1	Main
2	02 00......02 15	J2	Main
3	03 00......03 15	J3	Main
4	04 00......04 15	J4	Main
5	05 00......05 15	J5	Main
6	06 00......06 15	J6	Main
7	07 00......07 15	J7	Main
8	08 00......08 15	J8	Main
9	09 00......09 15	J9	Main
10	10 00......10 15	J10	Main
11	11 00......11 15	J1	Expansion Cabinet 1
12	12 00......12 15	J2	Expansion Cabinet 1
13	13 00......13 15	J3	Expansion Cabinet 1
14	14 00......14 15	J4	Expansion Cabinet 1
15	15 00......15 15	J5	Expansion Cabinet 1
16	16 00......16 15	J6	Expansion Cabinet 1
17	17 00......17 15	J7	Expansion Cabinet 1
18	18 00......18 15	J8	Expansion Cabinet 1
19	19 00......19 15	J9	Expansion Cabinet 1
20	20 00......20 15	J10	Expansion Cabinet 1

Table 37
Terminal number assignments — Main and Expansion Cabinets 1 and 2 (Part 2 of 2)

21	21 00.....21 15	J1	Expansion Cabinet 2
22	22 00......22 15	J2	Expansion Cabinet 2
23	23 00......23 15	J3	Expansion Cabinet 2
24	24 00......24 15	J4	Expansion Cabinet 2
25	25 00......25 15	J5	Expansion Cabinet 2
26	26 00......26 15	J6	Expansion Cabinet 2
27	27 00......27 15	J7	Expansion Cabinet 2
28	28 00......28 15	J8	Expansion Cabinet 2
29	29 00......29 15	J9	Expansion Cabinet 2
30	30 00......30 15	J10	Expansion Cabinet 2

Table 38
Terminal number assignments – Expansion Cabinets 3 and 4 (Part 1 of 2)

Card	First TN......Last TN	Cable	Cabinet
31	31 00......31 15	J1	Expansion Cabinet 3
32	32 00......32 15	J2	Expansion Cabinet 3
33	33 00......33 15	J3	Expansion Cabinet 3
34	34 00......34 15	J4	Expansion Cabinet 3
35	35 00......35 15	J5	Expansion Cabinet 3
36	36 00......36 15	J6	Expansion Cabinet 3
37	37 00......37 15	J7	Expansion Cabinet 3
38	38 00......38 15	J8	Expansion Cabinet 3
39	39 00......39 15	J9	Expansion Cabinet 3
40	40 00......40 15	J10	Expansion Cabinet 3

Table 38
Terminal number assignments – Expansion Cabinets 3 and 4 (Part 2 of 2)

41	41 00.....41 15	J1	Expansion Cabinet 4
42	42 00......42 15	J2	Expansion Cabinet 4
43	43 00......43 15	J3	Expansion Cabinet 4
44	44 00......44 15	J4	Expansion Cabinet 4
45	45 00......45 15	J5	Expansion Cabinet 4
46	46 00......46 15	J6	Expansion Cabinet 4
47	47 00......47 15	J7	Expansion Cabinet 4
48	48 00......48 15	J8	Expansion Cabinet 4
49	49 00......49 15	J9	Expansion Cabinet 4
50	50 00......50 15	J10	Expansion Cabinet 4

Table 39
Power fail transfer unit connections

QUA6 J1 Cable			
Function	**Pair**	**Color**	**Connects to**
PFT 1	5T 5R	W-S S-W	Connect to the telephone
	6T 6R	R-BL BL-R	Connect to the telephone line card
	7T 7R	R-O O-R	Connect to the central office trunk
	8T 8R	R-G G-R	Connect to the trunk line card
PFT 2	9T 9R	R-BR BR-R	Connect to the telephone
	10T 10R	R-S S-R	Connect to the telephone line card
	11T 11R	BK-BL BL-BK	Connect to the central office trunk
	12T 12R	BK-O O-BK	Connect to the trunk line card
PFT 3	13T 13R	BK-G G-BK	Connect to the telephone
	14T 14R	BK-BR BR-BK	Connect to the telephone line card
	15T 15R	BK-S S-BK	Connect to the central office trunk
	16T 16R	Y-BL BL-Y	Connect to the trunk line card

Table 40
Power fail transfer unit connections

QUA6 J1 Cable			
Function	**Pair**	**Color**	**Connects to**
PFT 4	17T 17R	Y-O O-Y	Connect to the telephone
	18T 18R	Y-G G-Y	Connect to the telephone line card
	19T 19R	Y-BR BR-Y	Connect to the central office trunk
	20T 20R	Y-S S-Y	Connect to the trunk line card
PFT 5	21T 21R	V-BL BL-V	Connect to the telephone
	22T 22R	V-O O-V	Connect to the telephone line card
	23T 23R	V-G G-V	Connect to the central office trunk
	24T 24R	V-BR BR-V	Connect to the trunk line card

Table 41
Cable Pair Color Combinations

Color	W-Bl Bl-W	W-O O-W	W-G G-W	W-BR BR-W	W-S S-W	R-BL BL-R	R-O O-R	R-G G-R
Unit	0	1	2	3	4	5	6	7
Color	R-BR BR-R	R-S S-R	BK-BL BL-BK	BK-O O-BK	BK-G G-BK	BK-BR BR-BK	BK-S S-BK	Y-B B-Y
Unit	8	9	10	11	12	12	14	15

Table 42
Main Cabinet Default DN assignments (Part 1 of 2)

Cable	Unit			Default Directory Number (DN)					
J1	**0 - 7**	2200	2201	2202	2203	2204	2205	2206	2207
J1	**8 - 15**	2208	2209	2210	2211	2212	2213	2214	2215
J2	**0 - 7**	2216	2217	2218	2219	2220	2221	2222	2223
J2	**8 - 15**	2224	2225	2226	2227	2228	2229	2230	2231
J3	**0 - 7**	2232	2233	2234	2235	2236	2237	2238	2239
J3	**8 - 15**	2240	2241	2242	2243	2244	2245	2246	2247
J4	**0 - 7**	2248	2249	2250	2251	2252	2253	2254	2255
J4	**8 - 15**	2256	2257	2258	2259	2260	2261	2262	2263
J5	**0 - 7**	2264	2265	2266	2267	2268	2269	2270	2271
J5	**8 - 15**	2272	2273	2274	2275	2276	2277	2278	2279

Table 42
Main Cabinet Default DN assignments (Part 2 of 2)

J6	**0 - 7**	2280	2281	2282	2283	2284	2285	2286	2287
J6	**8 - 15**	2288	2289	2290	2291	2292	2293	2294	2295
J7	**0 - 7**	2296	2297	2298	2299	2300	2301	2302	2303
J7	**8 - 15**	2304	2305	2306	2307	2308	2309	2310	2311
J8	**0 - 7**	2312	2313	2314	2315	2316	2317	2318	2319
J8	**8 - 15**	2320	2321	2322	2323	2324	2325	2326	2327
J9	**0 - 7**	2328	2329	2330	2331	2332	2333	2334	2335
J9	**8 - 15**	2336	2337	2338	2339	2340	2341	2342	2343
J10	**0 - 7**	2344	2345	2346	2347	2348	2349	2350	2351
J10	**8 - 15**	2352	2353	2354	2355	2356	2357	2358	2359

Table 43
Expansion Cabinet 1 Default DN assignments (Part 1 of 2)

Cable	**Unit**			**Default Directory Number (DN)**					
J1	**0 - 7**	2360	2361	2362	2363	2364	2365	2366	2367
J1	**8 - 15**	2368	2369	2370	2371	2372	2373	2374	2375
J2	**0 - 7**	2376	2377	2378	2379	2380	2381	2382	2383
J2	**8 - 15**	2384	2385	2386	2387	2388	2389	2390	2391
J3	**0 - 7**	2392	2393	2394	2395	2396	2397	2398	2399
J3	**8 - 15**	2400	2401	2402	2403	2404	2405	2406	2407

Table 43
Expansion Cabinet 1 Default DN assignments (Part 2 of 2)

J4	**0 - 7**	2408	2409	2410	2411	2412	2413	2414	2415
J4	**8 - 15**	2416	2417	2418	2419	2420	2421	2422	2423
J5	**0 - 7**	2424	2425	2426	2427	2428	2429	2430	2431
J5	**8 - 15**	2432	2433	2434	2435	2436	2437	2438	2439
J6	**0 - 7**	2440	2441	2442	2443	2444	2445	2446	2447
J6	**8 - 15**	2448	2449	2450	2451	2452	2453	2454	2455
J7	**0 - 7**	2456	2457	2458	2459	2460	2461	2462	2463
J7	**8 - 15**	2464	2465	2466	2467	2468	2469	2470	2471
J8	**0 - 7**	2472	2473	2474	2475	2476	2477	2478	2479
J8	**8 - 15**	2480	2481	2482	2483	2484	2485	2486	2487
J9	**0 - 7**	2488	2489	2490	2491	2492	2493	2494	2495
J9	**8 - 15**	2496	2497	2498	2499	2500	2501	2502	2503
J10	**0 - 7**	2504	2505	2506	2507	2508	2509	2510	2511
J10	**8 - 15**	2512	2513	2514	2515	2516	2517	2518	2519

Table 44
Expansion Cabinet 2 Default DN assignments (Part 1 of 2)

Cable	**Unit**			**Default Directory Number (DN)**					
J1	**0 - 7**	2520	2521	2522	2523	2524	2525	2526	2527
J1	**8 - 15**	2528	2529	2530	2531	2532	2533	2534	2535

Table 44
Expansion Cabinet 2 Default DN assignments (Part 2 of 2)

J2	**0 - 7**	2536	2537	2538	2539	2540	2541	2542	2543
J2	**8 - 15**	2544	2545	2546	2547	2548	2549	2552	2551
J3	**0 - 7**	2552	2553	2554	2555	2556	2557	2558	2559
J3	**8 - 15**	2560	2561	2562	2563	2564	2565	2566	2567
J4	**0 - 7**	2568	2569	2570	2571	2572	2573	2574	2575
J4	**8 - 15**	2576	2577	2578	2579	2580	2581	2582	2583
J5	**0 - 7**	2584	2585	2586	2587	2588	2589	2590	2591
J5	**8 - 15**	2592	2593	2594	2595	2596	2597	2598	2599
J6	**0 - 7**	2600	2601	2602	2603	2604	2605	2606	2607
J6	**8 - 15**	2608	2609	2610	2611	2612	2613	2614	2615
J7	**0 - 7**	2616	2617	2618	2619	2620	2621	2622	2623
J7	**8 - 15**	2624	2625	2626	2627	2628	2629	2630	2631
J8	**0 - 7**	2632	2633	2634	2635	2636	2637	2638	2639
J8	**8 - 15**	2640	2641	2642	2643	2644	2645	2646	2647
J9	**0 - 7**	2648	2649	2650	2651	2652	2653	2654	2655
J9	**8 - 15**	2656	2657	2658	2659	2660	2661	2662	2663
J10	**0 - 7**	2664	2665	2666	2667	2668	2669	2670	2671
J10	**8 - 15**	2672	2673	2674	2675	2676	2677	2678	2679

Table 45
Expansion Cabinet 3 Default DN assignments (Part 1 of 2)

Cable	Unit			Default Directory Number (DN)					
J1	**0 - 7**	2680	2681	2682	2683	2684	2685	2686	2687
J1	**8 - 15**	2688	2689	2690	2691	2692	2693	2694	2695
J2	**0 - 7**	2696	2697	2698	2699	2700	2701	2702	2703
J2	**8 - 15**	2704	2705	2706	2707	2708	2709	2710	2711
J3	**0 - 7**	2712	2713	2714	2715	2716	2717	2718	2719
J3	**8 - 15**	2720	2721	2722	2723	2724	2725	2726	2727
J4	**0 - 7**	2728	2729	2730	2731	2732	2733	2734	2735
J4	**8 - 15**	2736	2737	2738	2739	2740	2741	2742	2743
J5	**0 - 7**	2744	2745	2746	2747	2748	2749	2750	2751
J5	**8 - 15**	2752	2753	2754	2755	2756	2757	2758	2759
J6	**0 - 7**	2760	2761	2762	2763	2764	2765	2766	2767
J6	**8 - 15**	2768	2769	2770	2771	2772	2773	2774	2775
J7	**0 - 7**	2776	2777	2778	2779	2780	2781	2782	2783
J7	**8 - 15**	2784	2785	2786	2787	2788	2789	2790	2791
J8	**0 - 7**	2792	2793	2794	2795	2796	2797	2798	2799
J8	**8 - 15**	2800	2801	2802	2803	2804	2805	2806	2807
J9	**0 - 7**	2808	2809	2810	2811	2812	2813	2814	2815
J9	**8 - 15**	2816	2817	2818	2819	2820	2821	2822	2823

Table 45
Expansion Cabinet 3 Default DN assignments (Part 2 of 2)

J10	**0 - 7**	2824	2825	2826	2827	2828	2829	2830	2831
J10	**8 - 15**	2832	2833	2834	2835	2836	2837	2838	2839

Table 46
Expansion Cabinet 4 Default DN assignments (Part 1 of 2)

Cable	**Unit**			**Default Directory Number (DN)**					
J1	**0 - 7**	2840	2841	2842	2843	2844	2845	2846	2847
J1	**8 - 15**	2848	2849	2850	2851	2852	2853	2854	2855
J2	**0 - 7**	2856	2857	2858	2859	2860	2861	2862	2863
J2	**8 - 15**	2864	2865	2866	2867	2868	2869	2870	2871
J3	**0 - 7**	2872	2873	2874	2875	2876	2877	2878	2879
J3	**8 - 15**	2880	2881	2882	2883	2884	2885	2886	2887
J4	**0 - 7**	2888	2889	2890	2891	2892	2893	2894	2895
J4	**8 - 15**	2896	2897	2898	2899	2900	2901	2902	2903
J5	**0 - 7**	2904	2905	2906	2907	2908	2909	2910	2911
J5	**8 - 15**	2912	2913	2914	2915	2916	2917	2918	2919
J6	**0 - 7**	2920	2921	2922	2923	2924	2925	2926	2927
J6	**8 - 15**	2928	2929	2930	2931	2932	2933	2934	2935
J7	**0 - 7**	2936	2937	2938	2939	2940	2941	2942	2943
J7	**8 - 15**	2944	2945	2946	2947	2948	2949	2950	2951

Table 46
Expansion Cabinet 4 Default DN assignments (Part 2 of 2)

J8	**0 - 7**	2952	2953	2954	2955	2956	2957	2958	2959
J8	**8 - 15**	2960	2961	2962	2963	2964	2965	2966	2967
J9	**0 - 7**	2968	2969	2970	2971	2972	2973	2974	2975
J9	**8 - 15**	2976	2977	2978	2979	2980	2981	2982	2983
J10	**0 - 7**	2984	2985	2986	2987	2988	2989	2990	2991
J10	**8 - 15**	2992	2993	2994	2995	2996	2997	2998	2999

Cross-connecting terminal Digital Subscriber Loops

Refer to *Option 11C ISDN BRI Hardware Installation and Maintenance* (553-3011-311), for a complete description of terminal Digital Subscriber Loops (DSL) cross-connecting and installation.

Activating telephones

Activating telephones is straightforward. You activate each telephone by carrying out a procedure on the telephone itself. The software feature used to activate telephone sets is called “Automatic Set Configuration.”

> ***Note:*** The data feature cannot be activated using the procedures in this chapter. If you want to program a telephone with the data feature, you must manually program it in LD 11 with Data class of service as described in *Software Input/Output Guide Maintenance* (553-3001-511).

Procedures for activating the following models of telephones are outlined:

- a default model with default extension number
- a customized model with a customized extension number.

These procedures are presented for telephones with and without character displays.

Telephone tones

There are a number of different telephone tones. The following table includes tones that you will hear during telephone activation:

Table 47
Telephone tones

Dial tone	A continuous tone.
Special dial tone	Three beeps followed by continuous dial tone.
Overflow tone	Like a busy tone, except faster and higher.
Relocation tone	A short high-pitched beep lasting for 4 seconds, followed by silence.

Note 1: Before activating a telephone, make sure that you have decided on its final location and are aware of the model number assigned to it and if it is to be customized.

Note 2: When activating Meridian Digital telephones, remember that they differ from the older Meridian Modular telephones. Meridian Modular telephones are allowed a combined total of 128 model telephones, whereas Meridian Digital telephones are allowed 128 models for each type of telephone. When you activate a Meridian Digital telephone, you must select the model associated with that telephone type or the telephone will not work.

Activating a default model with a character display

Procedure 45
Activating the telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive a dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

If successful, the character display shows either “MODEL? X” (if the telephone relocation feature is **not** in use) or “RELOC OR MODEL? X” (if the telephone relocation feature **is** in use). “X” represents the default model for the telephone that you are activating.

Note 1: If you do not see the prompt “MODEL X” after lifting the handset, disconnect the telephone from the wall jack, wait five seconds, and re-insert the telephone into the jack. The telephone now shows “MODEL X” when you lift the handset.

Note 2: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the pound key (#) to select the default model.**

The character display shows “OK, EXTENSION? XXXX”. “XXXX” represents the default extension number for this telephone type.

3 **Press the pound key again to select the default extension number.**

You hear the relocation tone. The character display, shows “OK”.

OR

If the extension number is already in use by another telephone, you hear the special dial tone. If the telephone has a display it shows “MULTI-LINE, EXTENSION?”.

To accept the default extension number press the pound key.

To select a new extension number, manually enter an extension number and press the pound key.

OR

If the extension number is not available for use, the character display shows “ERROR, EXTENSION?“ and you hear overflow tone.

This happens when you choose an extension number manually or when extension numbers are entered for additional keys. A default extension number will not be offered if it is not available.

Step 3 must be repeated and you must manually enter a new extension number.

Note 1: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model.

Note 2: These extension numbers cannot be defaulted. The text display prompting for further extension numbers is “KEY kk EXT?” where “kk” represents the key number requiring the extension number.

Note 3: Each prompt for another extension number is accompanied by special dial tone. When you are programming an extension number, the lamp associated with that number on the telephone is lit.

4 **Hang up the telephone receiver.**

After approximately 10 seconds, the telephone is configured.

Note: If you replace the handset before completing the prompt sequence, the installation will automatically fail. This can be useful if you make an error and want to restart the procedure.

Activating a default model without a character display

Procedure 46
Activating the telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

Note: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the pound key (#) to select the default model.**

3 **Press the pound key again to select the default extension number.**

You hear a short, high-pitched beep lasting four seconds followed by silence (relocation tone).

Note: If the extension number is already in use by another telephone, you hear three beeps followed by continuous dial tone (special dial tone).

To accept the default extension number press the pound key.

To select a new extension number, manually enter an extension number and press the pound key.

If the extension number is not available for use, you hear a fast, high-pitched broken tone (overflow tone). (This happens when you choose an extension number manually or when extension numbers are entered for additional keys. A default extension number will not be offered if it is not available). Step 3 must be repeated and you must manually enter a new extension number.

Note: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model. These extension numbers cannot be defaulted. You are prompted for each additional extension number with three beeps followed by continuous dial tone (special dial tone). When you are programming an extension number, the lamp associated with that number on the telephone is lit.

Activating a customized model with a character display

Procedure 47
Activating a customized telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

If successful, the character display shows either “MODEL? X” (if the telephone relocation feature is **not** in use) or “RELOC OR MODEL? X” (if the telephone relocation feature **is** in use). “X” represents the default model for the telephone that you are activating.

Note 1: If you do not see the prompt “MODEL X” after lifting the handset, disconnect the telephone from the wall jack, wait five seconds, and re-insert the telephone into the jack. The telephone now shows “MODEL X” when you lift the handset.

Note 2: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the digits associated with the customized model and press the pound key (#).**

Dial tone disappears after the first digit is pressed and you hear special dial tone after you press the pound key. If you enter a valid model number the character display reads “OK, EXTENSION?”. If you enter an invalid model, the previous prompt is reissued and you hear overflow tone.

3 **Enter the customized extension number and press the pound key.**

You hear relocation tone. The character display shows “OK”.

OR

If the extension number is already in use by another telephone, you hear special dial tone again. The character display shows “MULTI-LINE, EXTENSION?”.

OR

If the extension number is not available for use, you hear overflow tone. The character display shows “ERROR, EXTENSION?” and you must repeat this step.

Note: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model. These extension numbers cannot be defaulted. The text display prompting for further extension numbers is “KEY kk EXT?” where “kk” represents the key number requiring the extension number. Each prompt for another extension number is accompanied by special dial tone. When you are programming an extension number, the lamp associated with that number on the telephone is lit.

4 **Hang up the telephone handset.**

After approximately 10 seconds, the telephone is configured.

Note: If you replace the handset before you complete the prompt sequence, the installation will automatically fail. This can be useful if you make an error and want to restart the procedure.

Activating a customized model without a character display

Procedure 48
Activating a customized telephone

1 **Plug the telephone set into the jack and wait 20 seconds before picking up the handset. If you do not receive dial tone, replace the handset and wait another 10 seconds before going off-hook again. Repeat this procedure until dial tone is received.**

Note: The 20 second time interval is required for the system to determine whether the set is new or if it is being relocated using the Modular Telephone Relocation feature.

2 **Press the digits associated with the customized model and press the pound key (#).**

Dial tone disappears after the first digit is pressed, and you hear three beeps followed by continuous dial tone (special dial tone) after you press the pound key.

3 **Enter the customized extension number and press the pound key.**

You hear a short high-pitched beep lasting four seconds, followed by silence (relocation tone).

If the extension number is already in use by another telephone, you hear special dial tone again.

If the extension number is not available for use, you hear a fast, high-pitched broken tone (overflow tone), and you must repeat this step.

4 **Hang up the telephone handset.**

After approximately 10 seconds, the telephone is configured.

Note: If other keys require secondary extension numbers, you are prompted until you enter all of the required extension numbers for the model. These extension numbers cannot be defaulted. You are prompted for each additional extension number with three beeps followed by continuous dial tone (special dial tone). When you are programming an extension number, the lamp associated with that number on the telephone is lit.

Activating terminals on a DSL

Refer to *Option 11C ISDN BRI Hardware Installation and Maintenance* (553-3011-311), for information about activating and initializing the various terminals that can be connected to a terminal DSL.

Connecting the trunks

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Reference list

The following are the references in this section:

- *Option 11C ISDN BRI Hardware Installation and Maintenance* (553-3011-311)

General information

This Chapter describes how to connect trunks directly to the trunk card, with or without the use of a Power Fail Transfer Unit (PFTU).

> ***Note:*** The QUA6 Power Fail Transfer Unit operates with loop-start and ground-start CO trunks. However, with ground-start trunks the associated telephone set must be equipped with a ground-start button.

On the Option 11C, during the initial software installation, the installer has the option of loading a default database containing pre-programmed trunk data into software. If necessary, the default data can be modified at any time to meet the specific needs of a customer. For a complete description of how to modify pre-programmed trunking data, refer to “Changing pre-programmed data” on page 387 in this Guide.

WARNING

Always use caution when installing or modifying telephone lines. Avoid installing telephone wiring during a lightning storm. Do not install telephone jacks in wet locations unless the jack is specifically designed for wet locations. Never touch uninsulated telephone wiring unless the line has been disconnected at the network interface.

Connecting trunks without PFTU

Procedure 49
Connecting trunks without PFTU

1 **From the assignment record, determine the location of the trunk connection and its associated Terminal Number (TN) at the cross-connect terminal.**

2 **With cross-connecting wire, connect the trunk to the TN.**

Make sure that the wiring is not reversed and is on the proper terminals.

The connections for trunks are listed in Table 49 on page 282, Table 50 on page 283 and Table 51 on page 284.

Connecting trunks with PFTU

Procedure 50
Connecting trunks with PFTU

1 **Locate the PFTU terminal blocks at the cross-connect terminal.**

2 **Cross-connect the first pair of the assigned PFT to the telephone.**

Refer to Table 48 on page 280 for PFTU connections.

3 **Cross-connect the second pair of the PFT to the TN assigned to the telephone.**

4 **Cross-connect the third pair of the PFT to the central office trunk.**

5 **Cross-connect the third pair of the PFT to the TN assigned to the trunk.**

6 **Repeat for each trunk assigned to the PFTU.**

Table 48
Power Failure Transfer Unit connections (Part 1 of 2)

QUA6 J1 cable				
Function	**Pair**	**Color**	**Connects to**	**Comments**
PFT 1	5T 5R	W-S S-W	Connect to the telephone	
	6T 6R	R-BL BL-R	Connect to the telephone line card	Connect to TN assigned to the telephone
	7T 7R	R-O O-R	Connect to the central office trunk	
	8T 8R	R-G G-R	Connect to the trunk line card	Connect to TN assigned to the trunk
PFT 2	9T 9R	R-BR BR-R	Connect to the telephone	
	10T 10R	R-S S-R	Connect to the telephone line card	Connect to TN assigned to the telephone
	11T 11R	BK-BL BL-BK	Connect to the central office trunk	
	12T 12R	BK-O O-BK	Connect to the trunk line card	Connect to TN assigned to the trunk
PFT 3	13T 13R	BK-G G-BK	Connect to the telephone	
	14T 14R	BK-BR BR-BK	Connect to the telephone line card	Connect to TN assigned to the telephone
	15T 15R	BK-S S-BK	Connect to the central office trunk	
	16T 16R	Y-BL BL-Y	Connect to the trunk line card	Connect to TN assigned to the trunk

Table 48
Power Failure Transfer Unit connections (Part 2 of 2)

PFT 4	17T 17R	Y-O O-Y	Connect to the telephone	
	18T 18R	Y-G G-Y	Connect to the telephone line card	Connect to TN assigned to the telephone
	19T 19R	Y-BR BR-Y	Connect to the central office trunk	
	20T 20R	Y-S S-Y	Connect to the trunk line card	Connect to TN assigned to the trunk
PFT 5	21T 21R	V-BL BL-V	Connect to the telephone	
	22T 22R	V-O O-V	Connect to the telephone line card	Connect to TN assigned to the telephone
	23T 23R	V-G G-V	Connect to the central office trunk	
	24T 24R	V-BR BR-V	Connect to the trunk line card	Connect to TN assigned to the trunk

Trunk Connections

NT8D14 Universal trunk card

The universal trunk card provides eight analog trunks which can function in the modes shown in Table 49 on page 282.

Table 49
NT8D14 Universal trunk — modes and option settings

Modes	Location	Jumper strap
Central (CO)	J1, J2	OFF
2- way tie trunk (loop Dial Repeat)	J1, J2	OFF
2 - way tie trunk (Outgoing Incoming Dial)	J1, J2	OFF
Recorded Announcement (RAN)	J1, J2	OFF
Paging trunk	J1, J2	OFF
Japan CO/DID operation	J1, J2	OFF
DID operation Loop length>2000 Ω	J1, J2	ON
DID operation Loop length <2000 Ω	J1, J2	OFF
Note: OFF indicates no strap present. J1 and J2 locations apply to all eight trunks.		

Refer to Table 50 on page 283 for the connections to the NT8D14 universal trunk at the cross-connect terminal.

Table 50
NT8D14 Universal trunk connections (Part 1 of 2)

Cable from cabinet			**RAN mode**	**Paging mode**	**All other modes**
Pair	**Color**		**Designations**		
1T	W-BL	Unit 0	T0	T0	T0
1R	BL-W		R0	R0	R0
2T	W-O		CP	A	
2R	O-W		MB	PG	
3T	W-G	Unit 1	T1	T1	T1
3R	G-W		R1	R1	R1
4T	W-BR		CP	A	
4R	BR-W		MB	PG	
5T	W-S	Unit 2	T2	T2	T2
5R	S-W		R2	R2	R2
6T	R-BL		CP	A	
6R	BL-R		MB	PG	
7T	R-O	Unit 3	T3	T3	T3
7R	O-R		R3	R3	R3
8T	R-G		CP	A	
8R	G-R		MB	PG	
9T	R-BR	Unit 4	T4	T4	T4
9R	BR-R		R4	R4	R4
10T	R-S		CP	A	
10R	S-R		MB	PG	
11T	BK-BL	Unit 5	T5	T5	T5
11R	BL-BK		R5	R5	R5
12T	BK-O		CP	A	
12R	O-BK		MB	PG	

Table 50
NT8D14 Universal trunk connections (Part 2 of 2)

13T	BK-G	Unit 6	T6	T6	T6
13R	G-BK		R6	R6	R6
14T	BK-BR		CP	A	
14R	BR-BK		MB	PG	
15T	BK-S	Unit 7	T7	T7	T7
15R	S-BK		R7	R7	R7
16T	Y-BL		CP	A	
16R	BL-Y		MB	PG	
Note: Remaining pairs are spares.					

NT8D15 E&M Trunk card

Table 51
NT8D15 E&M Trunk card (Part 1 of 2)

Cables J1 through J10 from cabinet			**2W Paging mode**	**2W Type 1 mode**	**4W Type 1 mode**	**4W Type 2 mode**
Pair	**Color**		**Designations**			
1T	W-BL	Unit 0	T0	T0	TA	TA
1R	BL-W		R0	R0	TB	TB
2T	W-O				RA	RA
2R	O-W				RB	RB
3T	W-G			E	E	EA
3R	G-W			M	M	EB
4T	W-BR		A		ESC	MA
4R	BR-W		PG		ESCG	MB

Table 51
NT8D15 E&M Trunk card (Part 2 of 2)

5T 5R	W-S S-W	Unit 1	T1 R1	T1 R1	TA TB	TA TB
6T 6R	R-BL BL-R				RA RB	RA RB
7T 7R	R-O O-R			E M	E M	EA EB
8T 8R	R-G G-R		A PG		ESC ESCG	MA MB
9T 9R	R-BR BR-R	Unit 2	T2 R2	T2 R2	TA TB	TA TB
10T 10R	R-S S-R				RA RB	RA RB
11T 11R	BK-BL BL-BK			E M	E M	EA EB
12T 12R	BK-O O-BK		A PG		ESC ESCG	MA MB
13T 13R	BK-G G-BK	Unit 3	T3 R3	T3 R3	TA TB	TA TB
14T 14R	BK-BR BR-BK				RA RB	RA RB
15T 15R	BK-S S-BK			E M	E M	EA EB
16T 16R	Y-BL BL-Y		A PG		ESC ESCG	MA MB

Note: A and B are the transmit and receive pairs, where:
TA = Transmit Tip, and RA = Receive Tip
TB = Transmit Ring, and RB = Receive Ring

NT6D70 SILC and NT6D71 UILC cards

Refer to *Option 11C ISDN BRI Hardware Installation and Maintenance* (553-3011-311) for a complete description of trunk DSL installation and connections.

Trunk connections (Europe)

E&M TIE trunk card (2-Wire)

> ***Note:*** Refer to the *Intelligent Peripheral Equipment Supplements* for a complete description of European circuit cards.

Table 52
E&M TIE trunk card (2-wire)

Cables J1 through J20 from cabinets				Column 1 Paging	Column 2 Paging	Column 3 Type 5(BPO)
Pair	**Color**	**Unit #**	**Pins**	**Lead Designations**		
1T	W-O	Unit 0	27	T0	T0	T0
1R	O-W		2	R0	R0	R0
2T	W-BR		29	A	SIGB	E
2R	BR-W		4	PG	SIGA	M
3T	R-BL	Unit 1	31	T1	T1	T1
3R	BL-R		6	R1	R1	R1
4T	R-G		33	A	SIGB	E
4R	G-R		8	PG	SIGA	M
5T	R-S	Unit 2	35	T2	T2	T2
5R	S-R		10	R2	R2	R2
6T	BK-O		37	A	SIGB	E
6R	O-BK		12	PG	SIGA	M
7T	BK-BR	Unit 3	39	T3	T3	T3
7R	BR-BK		14	R3	R3	R3
8T	Y-BL		41	A	SIGB	E
8R	BL-Y		16	PG	SIGA	M

Table 53
E&M 2-wire Type 2

Lead designations	Pins	Pair color	Unit number
T0	27	W-O	Unit 0
R0	2	O-W	
E1	28	W-G	
E2	3	G-W	
M1	29	W-G	
M2	4	G-W	
T1	31	R-BL	Unit 1
R1	6	BL-R	
E1	32	R-O	
E2	7	O-R	
M1	33	R-G	
M2	8	G-R	
T2	35	R-S	Unit 2
R2	10	S-R	
E1	36	BK-BL	
E2	11	BL-BK	
M1	37	BK-O	
M2	12	O-BK	
T3	39	BK-BR	Unit 3
R3	14	BR-BK	
E1	40	BK-S	
E2	15	S-BK	
M1	41	Y-BL	
M2	16	BL-Y	

E&M TIE trunk card (4-Wire)

Table 54
E&M TIE trunk card (4-wire)

Cables J1 through J20 from cabinets				Column 1 Type 1 & 5	Column 2 Type 1 & 5
Pair	**Color**	**Unit #**	**Pins**	**Lead Designations**	
1T	W-BL	Unit 0	26	RA	TA
1R	BL-W		1	RB	TB
2T	W-O		27	TA	RA
2R	O-W		2	TB	RB
3T	W-G		28	E	E
3R	G-W		3	M	M
4T	W-S	Unit 1	30	RA	TA
4R	S-W		5	RB	TB
5T	R-BL		31	TA	RA
5R	BL-R		6	TB	RB
6T	R-O		32	E	E
6R	O-R		7	M	M
7T	R-BR	Unit 2	34	RA	TA
7R	BR-R		9	RB	TB
8T	R-S		35	TA	RA
8R	S-R		10	TB	RB
9T	BK-BL		36	E	E
9R	BL-BK		11	M	M
10T	BK-G	Unit 3	38	RA	TA
10R	G-BK		13	RB	TB
11T	BK-BR-		39	TA	RA
11R	BR-BK		14	TB	RB
12T	BK-S		40	E	E
12R	S-BK		15	M	M

Note: The cable pair designated TA, TB is the transmit pair. The pair designated RA, RB is the receive pair.

Table 55
E&M TIE trunk card (4-wire) (Part 1 of 2)

Cables J1 through J20 from cabinets				Column 1 Type 2	Column 2 Type 2
Pair	**Color**	**Unit #**	**Pins**	**Lead Designations**	
1T	W-BL	Unit 0	26	RA	RA
1R	BL-W		1	RB	RB
2T	W-O		27	TA	TA
2R	O-W		2	TB	TB
3T	W-G		28	E1	E
3R	G-W		3	E2	M
4T	W-BR		29	M1	SIG0A
4R	BR-W		4	M2	SIG0B
5T	W-S	Unit 1	30	RA	RA
5R	S-W		5	RB	RB
6T	R-BL		31	TA	TA
6R	BL-R		6	TB	TB
7T	R-O		32	E1	E
7R	O-R		7	E2	M
8T	R-G		33	M1	SIG1A
8R	G-R		8	M2	SIG1B
9T	R-BR	Unit 2	34	RA	RA
9R	BR-R		9	RB	RB
10T	R-S		35	TA	TA
10R	S-R		10	TB	TB
11T	BK-BL		36	E1	E
11R	BL-BK		11	E2	M
12T	BK-O		37	M1	SIG2A
12R	O-BK		12	M2	SIG2B

Table 55
E&M TIE trunk card (4-wire) (Part 2 of 2)

Cables J1 through J20 from cabinets				Column 1 Type 2	Column 2 Type 2
13T	BK-G	Unit 3	38	RA	RA
13R	G-BK		13	RB	RB
14T	BK-BR		39	TA	TA
14R	BR-BK		14	TB	TB
15T	BK-S		40	E1	E
15R	S-BK		15	E2	M
16T	Y-BL		41	M1	SIG3A
16R	BL-Y		16	M2	SIG3B
Note: The cable pair designated TA, TB is the transmit pair. The pair designated RA, RB is the receive pair.					

E&M TIE trunk card (2280Hz)

Table 56
E&M 2280 Hz TIE trunk connections

Lead designations	Pins	Pair color	Unit number
TA TB RA RB	26 1 27 2	W-BL BL-W W-O O-W	Unit 0
TA TB RA RB	30 5 31 6	W-S S-W R-BL BL-R	Unit 1
TA TB RA RB	34 9 35 10	R-BR BR-R R-S S-R	Unit 2
TA TB RA RB	38 13 39 14	BK-G G-BK BK-BR BR-BK	Unit 3

E&M TIE trunk card (RAN)

Table 57
E&M 2-wire Recorded Announcement trunk connections

Lead designations	Pins	Pair color	Unit number
T0 R0 SIG B SIG A	26 1 29 4	W-BL BL-W W-BR BR-W	Unit 0
T1 R1 SIG B SIG A	30 5 33 8	W-S S-W R-G G-R	Unit 1
T2 R2 SIG B SIG A	34 9 37 12	R-BR BR-R BK-O O-BK	Unit 2
T3 R3 SIG B SIG A	38 13 41 16	BK-G G-BK Y-BL BL-Y	Unit 3

E&M TIE trunk card (MUS)

Table 58
E&M 2-wire Music trunk connections (Part 1 of 2)

Lead designations	Pins	Pair color	Unit number
T0 R0	26 1	W-BL BL-W	Unit 0
T1 R1	30 5	W-S S-W	Unit 1

Table 58
E&M 2-wire Music trunk connections (Part 2 of 2)

T2	34	R-BR	Unit 2
R2	9	BR-R	
T3	38	BK-G	Unit 3
R3	13	G-BK	

CO & DID trunk card

Table 59
Central Office & Direct Inward Dial trunk connections (Part 1 of 2)

Cable from cabinets				Column 1	Column 2	Column 3
Pair	**Color**		**Pins**	**Lead designations**		
1T	W-BL	Unit 0	26	T0	T0	A0
1R	BL-W		1	R0	R0	B0
2T	W-O		27		PPM0	C0
2R	O-W		2		—	Spare
3T	W-G	Unit 1	28	T1	T1	A1
3R	G-W		3	R1	R1	B1
4T	W-BR		29		PPM1	C1
4R	BR-W		4		—	Spare
5T	W-S	Unit 2	30	T2	T2	A2
5R	S-W		5	R2	R2	B2
6T	R-BL		31		PPM2	C2
6R	BL-R		6		—	Spare
7T	R-O	Unit 3	32	T3	T3	A3
7R	O-R		7	R3	R3	B3
8T	R-G		33		PPM3	C3
8R	G-R		8		—	Spare

Table 59
Central Office & Direct Inward Dial trunk connections (Part 2 of 2)

9T	R-BR	Unit 4	34	T4	T4	A4
9R	BR-R		9	R4	R4	B4
10T	R-S		35		PPM4	C4
10R	S-R		10		—	Spare
11T	BK-BL	Unit 5	36	T5	T5	A5
11R	BL-BK		11	R5	R5	B5
12T	BK-O		37		PPM5	C5
12R	O-BK		12		—	Spare
13T	BK-G	Unit 6	38	T6	T6	A6
13R	G-BK		13	R6	R6	B6
14T	BK-BR		39		PPM6	C6
14R	BR-BK		14		—	Spare
15T	BK-S	Unit 7	40	T7	T7	A7
15R	S-BK		15	R7	R7	B7
16T	Y-BL		41		PPM7	C7
16R	BL-Y		16		—	Spare

Central Office trunk card

Table 60
Central Office trunk connections (Part 1 of 2)

Cable from cabinets				
Pair	**Color**		**Pins**	**Lead designations**
1T	W-BL	Unit 0	26	T0
1R	BL-W		1	R0
2T	W-O		27	
2R	O-W		2	
3T	W-G		28	
3R	G-W		3	
4T	W-BR		29	
4R	BR-W		4	
5T	W-S	Unit 1	30	T1
5R	S-W		5	R1
6T	R-BL		31	
6R	BL-R		6	
7T	R-O		32	
7R	O-R		7	
8T	R-G		33	
8R	G-R		8	
9T	R-BR	Unit 2	34	T2
9R	BR-R		9	R2
10T	R-S		35	
10R	S-R		10	
11T	BK-BL		36	
11R	BL-BK		11	
12T	BK-O		37	
12R	O-BK		12	

Table 60
Central Office trunk connections (Part 2 of 2)

13T	BK-G	Unit 3	38	T3
13R	G-BK		13	R3
14T	BK-BR		39	
14R	BR-BK		14	
15T	BK-S		40	
15R	S-BK		15	
16T	Y-BL		41	
16R	BL-Y		16	

Trunk connections (UK)

NT5K17 Direct Inward Dial card terminations

Cross connect the NT5K17 DDI card as follows:

Table 61
NT5K17 DDI cross-connect terminations (Part 1 of 2)

Pair	Pins	Pair color	Unit number
T0	26	W-BL	Unit 0
R0	1	BL-W	
	27	W-O	
	2	O-W	
T1	28	W-G	Unit 1
R1	3	G-W	
	29	W-BR	
	4	BR-W	
T2	30	W-S	Unit 2
R2	5	S-W	
	31	R-BL	
	6	BL-R	

Table 61
NT5K17 DDI cross-connect terminations (Part 2 of 2)

Pair	Pins	Pair color	Unit number
T3 R3	32 7	R-O O-R	Unit 3
	33 8	R-G G-R	
T4 R4	34 9	R-BR BR-R	Unit 4
	35 10	R-S S-R	
T5 R5	36 11	BK-BL BL-BK	Unit 5
	37 12	BK-O O-BK	
T6 R6	38 13	BK-G G-BK	Unit 6
	39 14	BK-BR BR-BK	
T7 R7	40 15	BK-S S-BK	Unit 7
	41 16	Y-BL BL-Y	

NT5K18 Exchange line trunk card terminations

Cross connect the NT5K18 Exchange line trunk card as shown in Table 62.

> ***Note:*** The connections on the NT5K18 Exchange line trunk card are polarity sensitive. Make sure the ground side of the trunk is connected to the A leg of the NT5K18 circuit. Make sure the -50 volt side of the trunk is connected to the B leg of the NT5K18 circuit.

Table 62
NT5K18 Exchange line trunk card cross-connect terminations (Part 1 of 2)

Pair	Pins	Pair color	Unit number
T0 R0	26 1	W-BL BL-W	Unit 0
	27 2	W-O O-W	
T1 R1	28 3	W-G G-W	Unit 1
	29 4	W-BR BR-W	
T2 R2	30 5	W-S S-W	Unit 2
	31 6	R-BL BL-R	
T3 R3	32 7	R-O O-R	Unit 3
	33 8	R-G G-R	
T4 R4	34 9	R-BR BR-R	Unit 4
	35 10	R-S S-R	
T5 R5	36 11	BK-BL BL-BK	Unit 5
	37 12	BK-O O-BK	

Table 62
NT5K18 Exchange line trunk card cross-connect terminations (Part 2 of 2)

Pair	Pins	Pair color	Unit number
T6 R6	38 13 39 14	BK-G G-BK BK-BR BR-BK	Unit 6
T7 R7	40 15 41 16	BK-S S-BK Y-BL BL-Y	Unit 7

NT5K19 Analog TIE line trunk card terminations

Cross connect the NT5K19 analog TIE line trunk card as shown in Table 63.

Note: The speech pairs on the NT5K19 card are polarity insensitive. The E&M signalling pairs, however, are polarity sensitive. Make sure the ground side of the trunk is connected to the A leg of the NT5K19 circuit. Make sure the -50 volt side of the trunk is connected to the B leg.

Table 63
NT5K19 2W paging mode terminations (Part 1 of 2)

Pair	Pins	Pair color	Unit number
T0 R0 A PG	27 2 29 4	W-O O-W W-BR BR-W	Unit 0
T1 R1 A PG	31 6 33 8	R-BL BL-R R-G G-R	Unit 1

Table 63
NT5K19 2W paging mode terminations (Part 2 of 2)

Pair	Pins	Pair color	Unit number
T2 R2 A PG	35 10 37 12	R-S S-R BK-O O-BK	Unit 2
T3 R3 A PG	39 14 41 16	BK-BR BR-BK Y-BL BL-Y	Unit 3

Table 64
NT5K19 2W Type 1 mode terminations

Pair	Pins	Pair color	Unit number
T0 R0 E M	27 2 28 3	W-O O-W W-G G-W	Unit 0
T1 R1 E M	31 6 32 &	R-BL BL-R R-O O-R	Unit 1
T2 R2 E M	35 10 36 11	R-S S-R BK-BL BL-BK	Unit 2
T3 R3 E M	39 14 40 15	BK-BR BR-BK BK-S S-BK	Unit 3

Table 65
NT5K19 4W Type 1 mode terminations

Pair	Pins	Pair color	Unit number
TA	26	W-BL	Unit 0
TB	1	BL-W	
RA	27	W-O	
RB	2	O-W	
E	28	W-G	
M	3	G-W	
RA	30	W-S	Unit 1
RB	5	S-W	
TA	31	R-BL	
RB	6	BL-R	
E	32	R-O	
M	7	O-R	
TA	34	R-BR	Unit 2
TB	9	BR-R	
RA	35	R-S	
RB	10	S-R	
E	36	BK-BL	
M	11	BL-BK	
TA	38	BK-G	Unit 3
TB	13	G-BK	
RA	39	BK-BR	
TB	14	BR-BK	
E	40	BK-S	
M	15	S-BK	

Table 66
NT5K19 AC15 mode pair terminations

Pair	Pins	Pair color	Unit number
TA	26	W-BL	Unit 0
TB	1	BL-W	
RA	27	W-O	
RB	2	O-W	
TA	30	W-S	Unit 1
TB	5	S-W	
RA	31	R-BL	
RB	6	BL-R	
TA	34	R-BR	Unit 2
TB	9	BR-R	
RA	35	R-S	
RB	10	S-R	
TA	38	BK-G	Unit 3
TB	13	G-BK	
RA	39	BK-BR	
TB	14	BR-BK	

Table 67
NT5K19 Recorded announcement mode pair terminations

Pair	Pins	Pair color	Unit number
T0	26	W-BL	Unit 0
R0	1	BL-W	
SIG B	29	W-BR	
SIG A	4	BR-W	
T1	30	W-S	Unit 1
R1	5	S-W	
SIG B	33	R-G	
SIG A	8	G-R	

Table 67
NT5K19 Recorded announcement mode pair terminations

T2 R2 SIG B SIG A	34 9 37 12	R-BR BR-R BK-O O-BK	Unit 2
T3 R3 SIG B SIG A	38 13 41 16	BK-G G-BK Y-BL BL-Y	Unit 3

Activating a default model trunk

Due to the automatic thirty second time-out on the administration menu, be sure that you have prepared the data that you want to input before you begin. To determine corresponding TNs and trunks, check the location of trunk cards in the cabinet or use LD 32.

INSTRUCTIONS FOR THE UK

Refer to the *Meridian 1 Guide for the UK Options 11C - 81C (P0912437)* for a list of the default trunk models and trunk routes used in the UK.

Procedure 51
Activating a default model trunk

1 **Pick up the handset of the administration telephone.**

2 **Enter the Option 11C administration Flexible Feature Code to access the administration menu.**

The prompt “PASSWORD?” appears.

3 **Enter the default administration telephone password.**

You hear special dial tone, and the prompt
“TASK?”
appears in the top line of the character display.

The second line of the display reads “1 ADD TRUNK”.

4 **Select “1 ADD TRUNK” by entering the number “1”.**

The prompt “ROUTE ACCESS?” appears on the character display.

5 **Enter the access code of the route to which you want to add a trunk and press the pound key (#).**

The prompt
“TN?”
asks you to enter a TN (Terminal Number) from one of the installed trunk cards.

If you do not enter a valid route number, “TN?” does not appear and the screen remains the same. If the type of trunk card does not match the route, the prompt “ROUTE ACCESS?” appears again, and you hear overflow tone.

6 **Enter the TN in Option 11 format (CCUU) and press the pound key.**

The prompt
“MODEL”
appears. If you enter an invalid TN, the display shows “INVALID, TN?” and you must enter a new TN using the Option 11 format.

7 **Press the digits to select a trunk model (as assigned in LD 16).**

The character display shows
“OK”.
After a delay of approximately 4 seconds you hear special dial tone.
The sequence is repeated when the prompt
“TN?”
appears on the character display.
The next valid trunk TN is automatically incremented after each trunk is activated.

8 **Terminate the sequence by hanging up the telephone receiver, or**

Repeat the sequence by going through the steps again.

By entering “#” when the procedure repeats, you accept the next TN and are prompted for the model type.

By entering “#” again, you accept the previously accepted model.

Note: The model chosen during the first trunk activation sequence will be the default model for all subsequent trunks until you hang up the telephone or manually enter a new trunk model number.

Activating a selected model trunk

Due to the automatic thirty second time-out on the administration menu, be sure that you have prepared the data that you want to input before you begin. To determine corresponding TNs and trunks, check the location of trunk cards in the cabinet or use LD 32.

Procedure 52
Activating a selected model trunk

1 **Pick up the handset of the administration telephone.**

2 **Enter the administration Flexible Feature Code to access the administration menu.**

3 **Enter the default administration telephone password.**

You hear special dial tone and the prompt "TASK?" appears on the top line of the character display. The second line of the character display reads "1 ADD TRUNK".

4 **Select "1 ADD TRUNK" by entering the number "1".**

The prompt
"ROUTE ACCESS?"
appears.

5 **Enter the access code of the configured trunk route to which you want to add the trunk and press the pound key (#).**

The prompt
"TN?"
asks you to enter a TN from one of the installed trunk cards. If you do not enter a valid route number, "TN?" does not appear and the screen remains the same. If the card does not match the route, the prompt "ROUTE ACCESS?" appears again, and you hear overflow tone.

6 **Enter the TN in Option 11 format (CCUU).**

The response
"MODEL?"
prompts you to select a model number for the trunk.

7 **Enter a trunk model number for the specified TN and route and press the pound key.**

The character display shows:

"OK"

After a delay of approximately 4 seconds you hear special dial tone and the sequence is repeated when the following prompt appears on the character display.

“TN?”

8 **Hang up or repeat the sequence.**

The sequence ends when the last unit in the card is used and the program is complete, or when you hang up the telephone receiver.

Note: The model used for the first trunk activated in the sequence will be the default for all subsequent trunks until the telephone is hung up unless you manually enter a new trunk model number.

Connecting an external alarm

Contents

This section contains information on the following topics:

General information 307

Alarm port assigned in software 307

Alarm through a QUA6 PFTU 308

Reference list

The following are the references in this section:

- *Maintenance* (553-3001-511)

General information

There are two methods of connecting an external alarm to the system:

- through an alarm port assigned in software
- through contacts in a QUA6 Power Fail Transfer Unit (PFTU).

Alarm port assigned in software

The system can be equipped with an alarm port using an analog line connected to an Analog (2500/500)-type telephone or other similar type of ringing or alerting device.

The alarm will operate when a BSD090 message indicates a power fault in the system. Information about BSD090 messages is contained in *Maintenance* (553-3001-511).

Procedure 53
Installing an alarm using an alarm port

1 **Install an analog (500/2500)-type line as described in "Connecting the telephones" on page 247.**

2 **Install an analog (500/2500)-type telephone or other similar alerting device used as an alarm to the line.**

The set can be typically assigned as a Model 20.

3 **Use LD 15 and make the following changes. Only the prompts requiring a response are listed. Press *return* in response to the other prompts.**

- Enter CHG in response to the prompt REQ
- Enter CDB in response to the prompt TYPE
- Enter the customer number (0-99) in response to the prompt CUST
- Enter the DN of the line assigned as an alarm port in response to the prompt ALDN.

Note: If the assigned DN is inadvertently called the alarm will activate. To avoid false alarms, make sure that the DN is not consistent with the assigned numbering.

- Press *return* in response to the remaining prompts.

Alarm through a QUA6 PFTU

A QUA6 PFTU can be used to connect an external alarm through normally open or normally closed contacts of one of its units. The contacts will operate under the same conditions as the PFTU itself, and can support the following capacities:

Table 68
AC and DC capacities

	AC	DC
Maximum switching power	50.0 V A.	30.0 W
Maximum switching voltage	125.0 V rms	150.0 V
Maximum switching current	0.5 A	0.5 A

Figure 98 on page 310 shows an example of the contacts on one unit (PFT1) of the PFTU. The contacts are show in normal operating mode, not in failure mode. Table 69 on page 310 gives the connections for all units on the PFTU.

Figure 98
Contacts in PFTU

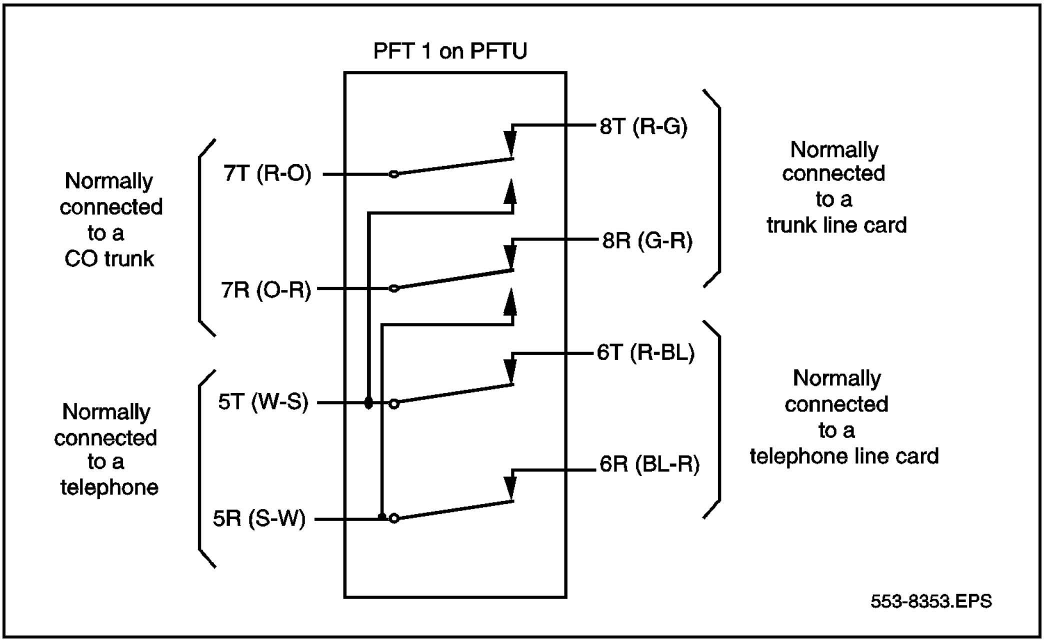
PFT 1 on PFTU
Normally connected to a CO trunk
7T (R-O)
7R (O-R)
Normally connected to a telephone
5T (W-S)
5R (S-W)
8T (R-G)
8R (G-R)
Normally connected to a trunk line card
6T (R-BL)
6R (BL-R)
Normally connected to a telephone line card
553-8353.EPS

Table 69
Power fail transfer unit connections (Part 1 of 3)

Unit	Pair	Color	Normal mode	Failure mode
PFT 1	5T 5R	W-S S-W	Makes with 6T and 6R	Opens 6T and 6R Makes with 7T and 7R
	6T 6R	R-BL BL-R	Makes with 5T and 5R	Open
	7T 7R	R-O O-R	Makes with 8T and 8R	Opens 8T and 8R Makes with 5T and 5R
	8T 8R	R-G G-R	Makes with 7T and 7R	Open

Table 69
Power fail transfer unit connections (Part 2 of 3)

PFT 2	9T 9R	R-BR BR-R	Makes with 10T and 10R	Opens 10T and 10R Makes with 11T and 11R
	10T 10R	R-S S-R	Makes with 9T and 9R	Open
	11T 11R	BK-BL BL-BK	Makes with 12T and 12R	Opens 12T and 12R Makes with 9T and 9R
	12T 12R	BK-O O-BK	Makes with 11T and 11R	Open
PFT 3	13T 13R	BK-G G-BK	Makes with 14T and 14R	Opens 14T and 14R Makes with 15T and 15R
	14T 14R	BK-BR BR-BK	Makes with 13T and 13R	Open
	15T 15R	BK-S S-BK	Makes with 16T and 16R	Opens 16T and 16R Makes with 13T and 13R
	16T 16R	Y-BL BL-Y	Makes with 15T and 15R	Open
PFT 4	17T 17R	Y-O O-Y	Makes with 18T and 18R	Opens 18T and 18R Makes with 19T and 19R
	18T 18R	Y-G G-Y	Makes with 17T and 17R	Open
	19T 19R	Y-BR BR-Y	Makes with 20T and 20R	Opens 20T and 20R Makes with 17T and 17R
	20T 20R	Y-S S-Y	Makes with 19T and 19R	Open

Table 69
Power fail transfer unit connections (Part 3 of 3)

PFT 5	21T 21R	V-BL BL-V	Makes with 22T and 22R	Opens 22T and 22R Makes with 23T and 23R
	22T 22R	V-O O-V	Makes with 21T and 21R	Open
	23T 23R	V-G G-V	Makes with 24T and 24R	Opens 24T and 24R Makes with 21T and 21R
	24T 24R	V-BR BR-V	Makes with 23T and 23R	Open

Pre-programmed data

Contents

This section contains information on the following topics:

General information 314
Passwords and codes 315
Default numbering plan 315
First digits 316
Important extension numbers 318
Flexible Feature Codes 324
SDI ports 325
ESDI settings 327
Telephone tones 327
Trunk routes 329
Trunk models 330
Model telephones 334
Administration telephones 338
Central Answering Position (CAP) model telephones 340
General business models 341
Analog (500/2500-type) telephone models 349
Hotel and Motel models 350
Health care telephone models 350

General information

When an Option 11C system is initially installed, customer data must be entered into the overlay programs. Telephones, for example, must be assigned features on their keys to allow them to function properly.

However, the Software Daughterboard can be pre-programmed with the customer data. If you load pre-programmed data into the system during the Installation process, some overlay entries will be automatically configured on the telephones. For example, you can choose a telephone model that has predetermined feature and key assignments and a preassigned class of service. This can be a significant time-saver if you have to program numerous types of telephone models.

Pre-programmed data is not mandatory for software installation. In fact, the Software Daughterboard can be programmed with the minimum number of files to allow the Option 11C to operate.

Passwords and codes

The following table shows each function in the left column and a corresponding password or code on the right.

Table 70
Passwords and codes

Function	Code or extension(s)
TTY password (For access to TTY Option 11C overlays)	0000
Meridian Mail administration password	adminpwd
Administration telephone password Administration telephone FFC	1234 *41
SPRE code	1
Telephone relocation Flexible Feature Code	*40
Telephone Removal Flexible Feature Code	*42
Telephone relocation password (SCRD)	1234

Default numbering plan

The default numbering plan for Option 11C is based on the following guidelines:

- The default numbering plan uses four digits and starts at 2200.
- The prime extension number (DN) for each telephone is in the range 2200-2XXX. The value of “XXX” varies depending on the number of telephones that you have in the system. Any secondary extension numbers use numbers outside this range. This arrangement allows Option 11 and Meridian Mail to automatically configure telephones and corresponding mailboxes without manual intervention.
- Meridian Mail uses extension 7000 for access, 7001 for Auto Attendant, 7002 for Express Messaging, and 7003 for Prompt Maintenance.

- Meridian Mail Virtual Agents are pre-configured for Card 10 in Unit 0, 1, 2, 8, 9, and 10 of the main cabinet.
- The Central Answering Position has an extension of 7700. This extension can be changed in LD 15.

First digits

Figure 71 on page 316 shows the default numbering plan for Option 11C:

Table 71
Default numbering plan — First digit

First digit	Pre-programmed use for digit
1	SPRE code
2	Not used
3	Not used
4	Not used
5	Not used
6	Not used
7	COT/TIE/DID/WATS/FEX/RAN/MUS/AWR/Paging Trunk access codes, Meridian Mail queues and attendant DN, Call park DNs
8	Not used
9	Not used
0	Attendant extension

Note: The first number of the default numbering plan is pre-programmed as 2200. The remaining numbers in the default numbering plan are designated in software, but do not become active until they are selected during the telephone activation procedure.

The digit “7” in the default numbering plan is programmed with many system features to assist you in configuring the Option 11C system. If you have the Meridian Mail card option software, it automatically configures user mail boxes to correspond with the 2200 numbering plan. In addition, the pre-programmed Meridian Mail queues in the Meridian Mail software match the default data on the Option 11C system.

Important extension numbers

Table 72
Default numbering plan—important extension numbers

Extension	Use
Attendant extension	0
First number in numbering plan	2200
Night number	7700*
Queue for Central Answering Position	7700 *
General ACD queue	7750 *
Meridian Mail miscellaneous ACD queues:	7000-7009
Meridian Mail extension Auto attendant extension Express messaging Prompt maintenance Miscellaneous queues	7000 7001 7002 7003 7004-7009
Meridian Mail position I.D.	7800-7811
Meridian Mail agent extensions	7830-7841
Call park extensions	7900-7919

* The thresholds which control the agent AWC keys have been set as follows:

CWTH	1
CWLF	2
CWLW	4

Extensions assigned to card slots

Table 73
Main cabinet

Slot number	Extension numbers
1	2200 through 2215
2	2216 through 2231
3	2232 through 2247
4	2248 through 2263
5	2264 through 2279
6	2280 through 2295
7	2296 through 2311
8	2312 through 2327
9	2328 through 2343
10	2344 through 2359

Table 74
Expansion cabinet 1

Slot number	Extension Numbers
1	2360 through 2375
2	2376 through 2391
3	2392 through 2407
4	2408 through 2423
5	2424 through 2439
6	2440 through 2455
7	2456 through 2471
8	2472 through 2487
9	2488 through 2503
10	2504 through 2519

Table 75
Expansion cabinet 2

Slot number	Extension Numbers
1	2520 through 2535
2	2536 through 2551
3	2552 through 2567
4	2568 through 2583
5	2584 through 2599
6	2600 through 2615
7	2616 through 2631
8	2632 through 2647
9	2648 through 2663
10	2664 through 2679

Table 76
Expansion cabinet 3

Slot number	Extension Numbers
1	2680 through 2695
2	2696 through 2711
3	2712 through 2727
4	2728 through 2743
5	2744 through 2759
6	2760 through 2775
7	2776 through 2791
8	2792 through 2807
9	2808 through 2823
10	2824 through 2839

Table 77
Expansion cabinet 4

Slot number	Extension Numbers
1	2840 through 2855
2	2856 through 2871
3	2872 through 2887
4	2888 through 2903
5	2904 through 2919
6	2920 through 2935
7	2936 through 2951
8	2952 through 2967
9	2968 through 2983
10	2984 through 2999

Flexible Feature Codes

Flexible Feature Code (FFC) data is used in many administrative procedures. The table below lists the FFCs for the Option 11C system.

Table 78
Flexible Feature Codes

FFC Prompt	FFC	Definition
ASRC	*40	Automatic Set Relocation
AREM	*42	Automatic Set Removal Code
ADMN	*41	Administration Set Access Code
CFWA	#1	Call Forward All Calls Activate
CFWD	#1	Call Forward All Calls Deactivate
C6DS	*70	6 Party Conference Code
HOLD	#4	Permanent Call Hold
MNTC	*43	Maintenance Access Code
PUGR	*71	Pick-up Group Code
RDLN	*72	Last Number Re-dial
RDST	*73	Store Last Number Re-dial
RGAA	*74	Ring Again Activate
RGAD	*75	Ring Again Deactivate
RGAV	*77	Ring Again Verify
SPCC	#2/*80	Speed Call Controller Code
SPCU	#3/*81	Speed Call User Code
SSPU	*89	System Speed Call User Code

SDI ports

The minimum system port configuration for Option 11C is 3 SDI ports, all of which can be found on the NTDK20 System Core card.

You can obtain additional ports by installing an NTAK02 SDI/DCH circuit card. The SDI/DCH card has 4 serial I/O ports with three possible configurations:

- 2 asynchronous ESDI ports with 2 DCHI ports
- 2 synchronous ESDI ports, or
- 2 SDI ports.

The default SDI port configuration is shown below. The value for “XX” is set on the faceplate of the CPU/CONF circuit card.

Table 79
Pre-configured SDI ports

TTY Number	Card	Port	Use	Configuration
0	0	0	MTC/SCH/BUG	XX/8/1/NONE
1	0	0	MTC/SCH/BUG	1200/8/1/NONE
2	0	1	MTC/SCH/BUG	1200/8/1/NONE
8	10	0	LSL	1200/8/1/NONE
9	10	1	CMS	4800

Administration and maintenance terminal port

Option 11E has two pre-configured maintenance ports on the NTBK45 System core card: port 1 and port 2.

Modem port

The pre-configured modem port allows the remote maintenance modem to be connected with further system programming. This port is pre-configured as TTY 0 (port 0 on the System core card) and is programmed for Maintenance (MTC), Service Change (SCH) and BUG messages.

Enhanced Serial Data Interface (ESDI) port

Port 9 is pre-programmed as an ESDI port and supports Meridian Mail. It functions as a Command Status Link with the settings given in Table 80:

ESDI settings

Table 80
ESDI settings

Setting	Code
BPS	4800
CLOK	EXT
IADR	003
RADR	001
T1	10
T2	002
T3	040
N1	128
N2	08
K	7
RXMT	05
CRC	10
ORUR	005
ABOR	005
USER	CMS
ENL	NO

Telephone tones

The telephone tones in North America are as follows:

Dial tone – A continuous tone.

Special dial tone – Three beeps followed by continuous dial tone.

Overflow tone – Like a busy tone, except faster and higher.

Relocation tone – A short high-pitched beep lasting for 4 seconds, followed by silence.

Trunk routes

Table 81 on page 329 shows pre-programmed trunk route information that you need on hand to activate and modify trunks.

Table 81
Pre-programmed trunk route information

Route	Type	Access Code	Mode	Interface
00 *	COT	7100	IAO	–
01 *	COT	7101	ICT	–
02 *	COT	7102	OGT	–
03	TIE	7103	IAO	-
04	TIE	7104	ICT	–
05	TIE	7105	OGT	–
06	DID	7106	ICT	–
07	WAT	7107	IAO	–
08	WAT	7108	ICT	–
09	WAT	7109	OGT	–
40	MUS	7140	OGT	–
41	AWR	7141	–	AUD
42	RAN	7142	–	DGT
43	RAN	7143	–	AUD
44	PAG	7144	OGT	–
50	FEX	7150	IAO	–
51	FEX	7151	ICT	–
52	FEX	7152	OGT	–

Note: Trunk routes marked with an asterisk (*) are configured support Call Detail Recording (CDR) output. The CDR is pre-configured as follows:

CDR	YES
INC	YES
OAL	YES
AIA	YES

Trunk models

Note: All trunks are programmed as immediate start / supervision = yes, with the exception of trunks with an asterisk beside them (*). Trunks marked with an asterisk (*) are set for wink start / supervision = yes.

Table 82
Trunk model information (Part 1 of 4)

Mode	Pack	Model	Signaling	DIP or DTN	BIMP and TIMP
COT	XUT	1	GRD	DIP	3COM/600
		2	LOP	DIP	3COM/600
		3	GRD	DTN	3COM/600
		4	LOP	DTN	3COM/600
		5	GRD	DIP	3COM/900
		6	LOP	DIP	3COM/900
		7	GRD	DTN	3COM/900
		8	LOP	DTN	3COM/900
TIE	XUT	1	OAD	DIP	3COM/600
		2	LDR	DIP	3COM/600
		3	OAD	DTN	3COM/600
		4	LDR	DTN	3COM/600
		5	OAD	DIP	3COM/900
		6	LDR	DIP	3COM/900

Table 82
Trunk model information (Part 2 of 4)

		7	OAD	DTN	3COM/900
		8	LDR	DIP	3COM/900
	XEM	16	EAM	DIP	- /600
		17	EM4	DIP	—
		18	EAM	DTN	- / 600
		19	EM4	DIP	—
DID	XUT	1	LDR (Wink Start Supv = Yes)	DIP	3COM/600
		2	LDR (Wink Start Supv = Yes)	DTN	3COM/600
		3	LDR (Wink Start Supv = Yes)	DIP	3COM/900
		4	LDR (Wink Start Supv = Yes)	DTN	3COM/900
		5*	LDR (Wink Start Supv = Yes)	DIP	3COM/600
		6*	LDR (Wink Start Supv = Yes)	DTN	3COM/600

Table 82
Trunk model information (Part 3 of 4)

		7*	LDR (Wink Start Supv = Yes)	DIP	3COM/900
		8*	LDR (Wink Start Supv = Yes)	DTN	3COM/900
WAT	XUT	1	GRD	DIP	3COM/600
		2	LOP	DIP	3COM/600
		3	GRD	DTN	3COM/600
		4	LOP	DTN	3COM/600
		5	GRD	DIP	3COM/900
		6	LOP	DIP	3COM/900
		7	GRD	DTN	3COM/900
		8	LOP	DTN	3COM/900
MUS	XUT	1			3COM/600
AWR	XUT	1			600/1200
RAN	XUT	1			600/1200
PAG	XUT	1	LDR	DIP	3COM/600
		2	OAD	DIP	3COM/600
		3	LDR	DTN	3COM/600
		4	OAD	DTN	3COM/600
		5	LDR	DIP	3COM/900
		6	OAD	DIP	3COM/900
		7	LDR	DTN	3COM/900

Table 82
Trunk model information (Part 4 of 4)

		8	OAD	DTN	3COM/900
	XEM	16	EAM	DIP	-/600
		17	EM4	DIP	—
		18	EAM	DTN	- /600
		19	EM4	DTN	—
FEX	XUT	1	GRD	DIP	3COM/600
		2	LOP	DIP	3COM/600
		3	GRD	DTN	3COM/600
		4	LOP	DTN	3COM/600
		5	GRD	DIP	3COM/900
		6	LOP	DIP	3COM/900
		7	GRD	DTN	3COM/900
		8	LOP	DTN	3COM/900

* These trunks are set for Wink start.

Model telephones

> *Note:* OPS telephones do not have their own telephone models. You can, however, create OPS models in by entering DD in response to the CDEN prompt in LD 10.

With the exception of the administration and CAP model telephones, the models are organized according to software packages, as follows:

Administration telephones

- M2008 - one model
- M2616 - one model

CAP telephones

- M2616 - one model
- M2216 - one model

General Business telephones

- Analog (500/2500 type) telephones - seven models
- M2000 telephones
  - M2317 - two models
  - M2009 - two models
  - M2112 - two models
  - M2018 - two models
- M2006 - five models
- M2008 - fifteen models
- M2616 - twelve models
- M2216 - two models
- M3000 - two models.

Hotel and Motel telephones

- 500- and 2500-type telephones - one model

- M2006 - two models
- M2008 - two models
- M2616 - one model

Health Care telephones

- M2006 - one model
- M2008 - four models
- M2616 - two models.

This section provides model numbers for each telephone type and tables showing the numbering and placement of the keys, and the feature assigned to each key.

Acronyms for Class of Service options are shown in the following tables for each model telephone in this section.

Table 83
Class of service options - analog telephones

Prompt	Meaning
TLD	Toll Denied
HTA	Hunting Allowed
LNA	Last Number Redial Allowed
FNA	Call Forward No Answer Allowed
PUA	Pickup Allowed
XRA	Ring Again Allowed
MWA	Message Waiting Allowed

.

Table 84
Class of Service options - digital telephones

Prompt	Meaning
TLD	Toll Denied
AAD	Automatic Answerback Denied
ADD	Automatic Digit Display
HTA	Hunting Allowed
LNA	Last Number Redial Allowed
FNA	Call Forward No Answer Allowed
PUA	Pickup Allowed
XRA	Ring Again Allowed
MWA	Message Waiting Allowed

.

Table 85
Class of Service Options - ACD telephones

Prompt	Meaning
UNR	Unrestricted
AAD	Automatic Answerback Denied
ADD	Automatic Digit Display
HTA	Hunting Allowed
LNA	Last Number Redial Allowed
FND	Call Forward No Answer Allowed
PUD	Pickup Denied
MWA	Message Waiting Allowed

Administration telephones

M2008 model 99

Intended use: Administration (maintenance) telephone
Assigned Class of Service options:
MTA/ADD/LNA/FNA/GPUA/MWA/FBD

Table 86
M2008 model 99

Key number position	Feature
7	Blank
6	Message
5	Transfer
4	Speed Call (personnel: 99)
3	Forward
2	Conference
1	DN
0	DN

M2616 model 99

Intended use: Administration (maintenance) telephone
Assigned Class of Service options:
MTA/LNA/FNA/GPUA/MWA/ADD//HFA/FBD

Table 87
M2616 model 99

Feature	Key number position	Key number position	Feature
–	15	7	–
Auto Dial	14	6	Message
Auto Dial	13	5	Transfer
Auto Dial	12	4	Ring Again
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Speed Call (personnel: 99)	8	0	DN

Central Answering Position (CAP) model telephones

M2616 and 2216 CAP telephone model 60

Intended use: Central Answering Position telephone

Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFD/AGN/FBD/SPV

Table 88
M2616 and 2216 CAP telephone model 60

Feature	Key number position	Key number position	Feature
Hot *	15	7	–
Make Set Busy	14	6	DN
Display Waiting Calls	13	5	Park
Auto Dial	12	4	Override
Auto Dial	11	3	Add
Auto Dial	10	2	Consult/Join
Auto Dial	9	1	Extend
Auto Dial	8	0	ACD Queue (7700)

* This key is used as a Hotline to connect to the office paging system. Assign it with the paging route access code and define it when you activate the telephone.

> ***Note:*** With the M2616 CAP you must use an ACD character display. In the system software, the Extend key is actually called a Transfer key, the Consult/Join key is called a Conference key, and the Add key is called a No Hold Conference key.

General business models

M2000 series telephones

The M2000 series telephones - M2112, M2018, M2317, M2009, and M3000 - are limited to a **combined total** of 128 model telephones. (In other words, there can be no more than a combined total of 128 different models for all the M2000 series telephones.)

It is up to you to make sure that the model associated with the telephone you are activating is pre-defined. You must select the model associated with the telephone or the telephone will not work.

M2317 model 20

Intended use: Two-line general business telephone with display
Assigned Class of Service options: FND/GPUA/LND/MWD/ADD/FBD

Table 89
M2317 model 20

Feature	Key number position	Key number position	Feature
–	-	5	Auto Dial
Auto Dial	10	4	Auto Dial
Auto Dial	9	3	Auto Dial
Auto Dial	8	2	Auto Dial
Auto Dial	7	1	DN
Auto Dial	6	0	DN

Table 90
Default features available using M2317 model 20 softkeys

Key number position	Feature
29	Language
28	Privacy Release
27	Ring Again
26	Transfer
25	Charge Account
24	Calling Party Number
23	Conference
17	Call Park

M2317 model 25

Intended use: Two-line general business telephone with message indication and display
Assigned Class of Service options: FNA/GPUA/LND/MWA/ADD/FBD

Table 91
M2317 model 25

Feature	Key number position	Key number position	Feature
–	-	5	Auto Dial
AutoDial	10	4	Auto Dial
Auto Dial	9	3	Auto Dial
Auto Dial	8	2	Auto Dial
Auto Dial	7	1	DN
Auto Dial	6	0	DN

Table 92
Default features available using M2317 model 25 softkeys

Key number position	Feature
29	Language
28	Privacy Release
27	Ring Again
26	Transfer
25	Charge Account
24	Calling Party Number
23	Conference
20	Message
17	Call Park

M2009 model 21

Intended use: Two-line general business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 93
M2009 model 21

Key number position	Feature
8	Auto Dial
7	Auto Dial
6	Transfer
5	Ring Again
4	Pick Up
3	Call Forward
2	Conference
1	DN
0	DN

M2009 model 26

Intended use: Two-line general business telephones with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Table 94
M2009 model 26

Key number position	Feature
8	Auto Dial
7	Message
6	Transfer
5	Ring Again
4	Pick Up
3	Call Forward
2	Conference
1	DN
0	DN

M2112 model 22

Intended use: Two-line general business telephone

Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 95
M2112 model 22

Feature	Key number position	Key number position	Feature
–	–	5	Ring Again
Auto Dial	10	4	Pick Up
Auto Dial	9	3	Call Forward
Auto Dial	8	2	Conference
Transfer	7	1	DN
Speed Call	6	0	DN

M2112 model 27

Intended use: Two-line general business telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Table 96
M2112 model 27

Feature	Key number position	Key number position	Feature
–	–	5	Ring Again
Auto Dial	10	4	Pick Up
Auto Dial	9	3	Call Forward
Message	8	2	Conference
Transfer	7	1	DN
Speed Call	6	0	DN

M2018 model 24

Intended use: Two-line general business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 97
M2018 model 24

Feature	Key number position	Key number position	Feature
Auto Dial	17	8	Auto Dial
Auto Dial	16	7	Auto Dial
Auto Dial	15	6	Transfer
Auto Dial	14	5	Ring Again
Auto Dial	13	4	Pick Up
Auto Dial	12	3	Call Forward
Auto Dial	11	2	Conference
Auto Dial	10	1	DN
Auto Dial	9	0	DN

M2018 model 29

Intended use: Two-line general business telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Table 98
M2018 model 29

Feature	Key number position	Key number position	Feature
Auto Dial	17	8	Auto Dial
Auto Dial	16	7	Message
Auto Dial	15	6	Transfer
Auto Dial	14	5	Ring Again
Auto Dial	13	4	Pick Up
Auto Dial	12	3	Call Forward
Auto Dial	11	2	Conference
Auto Dial	10	1	DN
Auto Dial	9	0	DN

Analog (500/2500-type) telephone models

Note: When you are activating an analog (500-type) telephone, you must use an analog (2500-type) telephone to define the features. When you have done this, disconnect the analog (2500-type) telephone and replace it with the analog (500-type) telephone that you are activating.Analog (500/2500-type) support personnel telephone models.

Table 99
Analog (500/2500-type) telephone models

Model	Type of telephone	Assigned Class of Service options
20	Support personnel telephone with toll denied	TLD, C6A, CFXD, DTN, FND, GPUA, LNA, XFA, XRA, FBD
21	Support personnel telephone	UNR, C6A, CFXD, DTN, FND, GPUA, LNA, XFA, XRA, FBD
22	Support personnel telephone with message indication lamp	MWA, TLD, C6A, CFXD, DTN, FNA, GPUA, LNA, XFA, XRA, FBD, LPA
23	Support personnel telephone with message indication lamp	MWA, UNR, C6A, CFXD, DTN, FNA, GPUA, LNA, XFA, XRA, FBD, LPA
24	Support personnel telephone with message indication and no lamp	MWA, TLD, C6A, CFXD, DTN, FNA, GPUA, LNA, XFA, XRA, FBD, LPD
25	Support personnel telephone with message indication and no lamp	MWA, UNR, C6A, CFXD, DTN, FNA, GPUA, LNA, XFA, XRA, FBD, LPD
26	Courtesy telephone	MNL, TLD

Hotel and Motel models

Analog 500- and 2500-type telephones

Note: When you are activating a 500-type telephone, you must use a 2500-type telephone to define the features. Once you have done this, unplug the 2500-type telephone and replace it with the 500-type telephone that you are activating.

Table 100
Hotel and Motel models

Model	Type of telephone	Assigned Class of Service options
40	Guest room telephone	CCSA/MWA/DTN

Health care telephone models

Analog 500- and 2500-type telephones

Note: When you are activating a 500-type telephone, you must use a 2500-type telephone to define the features. Once you have done this, unplug the 2500-type telephone and replace it with the 500-type telephone that you are activating.

Table 101
Health care telephone models

Model	Type of telephone	Assigned Class of Service options
50	Nurses’ station telephone with speed call	FND/LNA/GPUA/MWA/FBD
51	Nurses’ station telephone with message and speed call	FND/LNA/GPUA/MWA/NDD/FBD
52	Nurses’ station telephone with speed call and display	FND/LNA/GPUA/MWA/ADD/FBD
53	Nurses’ station set with message, speed call and display	ND/LNA/GPUA/MWA/ADD/FBD

M2006 model 20

Intended use: General business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/FBD/UNR

Table 102
M2006 model 20

Key number position	Feature
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 21

Intended use: General business telephone with message indicator
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/UNR

Table 103
M2006 model 21

Key number position	Feature
5	Message
4	Transfer
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 22

Intended use: General business telephone with message indication and speed call
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/UNR

Table 104
M2006 model 22

Key number position	Feature
5	Message
4	Speed Call
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 23

Intended use: General business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/FBD/TLD

Table 105
M2006 model 23

Key number position	Feature
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 24

Intended use: General business telephone with message indicator
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/TLD

Table 106
M2006 model 24

Key number position	Feature
5	Message
4	Transfer
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 25

Intended use: General business telephone with message indication and speed call
Assigned Class of Service options: FNA/GPUA/LNA/MWA/FBD/TLD

Table 107
M2006 model 25

Key number position	Feature
5	Message
4	Speed Call
3	Pick-Up
2	Forward
1	Conference
0	DN

M2006 model 40

Intended use: Hotel guest room telephone without message indication
Assigned Class of Service options: CCSA/MWA/FBD/CNDD/TLD/FND

Table 108
M2006 model 40

Key number position	Feature
5	Hot *
4	Hot *
3	Hot *
2	Hot *
1	Hot *
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2006 model 41

Intended use: Hotel guest room telephone with message indication
Assigned Class of Service options: CCSA/MWA/FBD/FNA/CNDD/TLD

Table 109
M2006 model 41

Key number position	Feature
5	Message
4	Hot *
3	Hot *
2	Hot *
1	Hot *
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2006 model 50

Intended use: Nurses station telephone with speed call
Assigned Class of Service options: FND/LNA/GPUA/MWA/FBD

Table 110
M2006 model 50

Key number position	Feature
5	Speed Call (personnel: 20)
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 20

Intended use: General business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 111
M2008 model 20

Key number position	Feature
7	Auto Dial
6	Auto Dial
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 21

Intended use: General business telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Table 112
M2008 model 21

Key number position	Feature
7	Auto Dial
6	Message
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 22

Intended use: General business telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Table 113
M2008 model 22

Key number position	Feature
7	–
6	Auto Dial
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 23

Intended use: General business set with message indication and display
Assigned Class of Service options: FNA/GPUA/LNA/MWA/ADD/FBD

Table 114
M2008 model 23

Key number position	Feature
7	–
6	Message
5	Transfer
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 24

Intended use: Two-line general business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 115
M2008 model 24

Key number position	Feature
7	Auto Dial
6	Transfer
5	Ring Again
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 25

Intended use: Two-line general business telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Table 116
M2008 model 25

Key number position	Feature
7	Auto Dial
6	Message
5	Transfer
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 26

Intended use: Two-line general business telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Table 117
M2008 model 26

Key number position	Feature
7	–
6	Transfer
5	Ring Again
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 27

Intended use: 2-line gen. business set with message indication and display
Assigned Class of Service options: FNA/GPUA/LNA/MWA/ADD/FBD

Table 118
M2008 model 27

Key number position	Feature
7	–
6	Message
5	Transfer
4	Pick-Up
3	Forward
2	Conference
1	DN
0	DN

M2008 model 28

Intended use: Two-line general business telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 119
M2008 model 28

Key number position	Feature
7	Auto Dial
6	Auto Dial
5	Auto Dial
4	Auto Dial
3	Forward
2	Conference
1	DN
0	DN

M2008 model 30

Intended use: Manager telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 120
M2008 model 30

Key number position	Feature
7	Transfer
6	Voice Call
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 31

Intended use: Manager telephone with message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/NDD/FBD

Table 121
M2008 model 31

Key number position	Feature
7	Voice Call
6	Message
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 32

Intended use: Manager telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Table 122
M2008 model 32

Key number position	Feature
7	-
6	Voice Call
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 33

Intended use: Manager telephone with display and message indication
Assigned Class of Service options: FNA/GPUA/LNA/MWA/ADD/FBD

Table 123
M2008 model 33

Key number position	Feature
7	-
6	Message
5	Voice Call
4	Speed Call (personnel: 20)
3	Forward
2	Conference
1	DN
0	DN

M2008 model 40

Intended use: Two-line guest room telephone
Assigned Class of Service options: CCSA/MWA/FBD/CNDD/FND/TLD

Table 124
M2008 model 40

Key number position	Feature
7	Hot *
6	Hot *
5	Hot *
4	Hot *
3	Hot *
2	Hot *
1	DN
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2008 model 41

Intended use: Two-line guest room telephone with message indication
Assigned Class of Service options: CCSA/MWA/FBD/FNA/CNDD/TLD

Table 125
M2008 model 41

Key number position	Feature
7	Message
6	Hot *
5	Hot *
4	Hot *
3	Hot *
2	Hot *
1	DN
0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2008 model 50

Intended use: Nurses station telephone with speed call
Assigned Class of Service options: FND/LNA/GPUA/MWA/NDD/FBD

Table 126
M2008 model 50

Key number position	Feature
7	Auto Dial
6	Transfer
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 51

Intended use: Nurses station telephone with message and speed call
Assigned Class of Service options: FNA/LNA/GPUA/MWA/NDD/FBD

Table 127
M2008 model 51

Key number position	Feature
7	Auto Dial
6	Message
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 52

Intended use: Nurses station telephone with speed call and display
Assigned Class of Service options: FND/LNA/GPUA/MWA/ADD/FBD

Table 128
M2008 model 52

Key number position	Feature
7	–
6	Auto Dial
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 53

Intended use: Nurses station set with message, speed call and display
Assigned Class of Service options: FNA/LNA/GPUA/MWA/ADD/FBD

Table 129
M2008 model 53

Key number position	Feature
7	–
6	Message
5	Speed Call
4	Ring Again
3	Pick-Up
2	Forward
1	Conference
0	DN

M2008 model 60

Intended use: Message center telephone
Assigned Class of Service options: FND/GPUA/LNA/MWA/NDD/FBD

Table 130
M2008 model 60

Key number position	Feature
7	Message Cancellation
6	Message Indication
5	Speed Call (personnel: 20)
4	Ring Again
3	Forward
2	Conference
1	DN
0	DN

M2008 model 61

Intended use: Message center telephone with display
Assigned Class of Service options: FND/GPUA/LNA/MWA/ADD/FBD

Table 131
M2008 model 61

Key number position	Feature
7	–
6	Message Cancellation
5	Message Indication
4	Speed Call (personnel: 20)
3	Forward
2	Conference
1	DN
0	DN

M2216 model 20

Intended use: ACD agent with display
Assigned Class of Service options: LNA/FND/GPUA/MWA/ADD/FBD

Table 132
M2216 model 20

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	-
Auto Dial	14	6	Transfer
Auto Dial	13	5	Speed Call
Auto Dial	12	4	Forward
Auto Dial	11	3	Conference
Auto Dial	10	2	Make Set Busy
ACD calls waiting	9	1	Not Ready
DN	8	0	ACD DN (7750)

M2216 model 30

Intended use: ACD supervisor with display
Assigned Class of Service options: LNA/FND/GPUA/MWA/ADD/FBD

Table 133
M2216 model 30

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	–
Auto Dial	14	6	Transfer
Auto Dial	13	5	Speed Call
Auto Dial	12	4	Forward
Auto Dial	11	3	Conference
Display Agents	10	2	Make Set Busy
Display Queue	9	1	Not Ready
DN	8	0	ACD DN (7750)

M2616 model 20

Intended use: Secretary telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Table 134
M2616 model 20

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	–
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Transfer
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Auto Dial	8	0	DN

M2616 model 21

Intended use: Secretary telephone with display and message indication
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/ADD/HFD/FBD

Table 135
M2616 model 21

Feature	Key number position	Key number position	Feature
Auto Dial	15	7	–
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Speed Call (personnel: 20)
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Transfer	8	0	DN

M2616 model 22

Intended use: Advanced business telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Table 136
M2616 model 22

Feature	Key number position	Key number position	Feature
–	15	7	Transfer
Auto Dial	14	6	Speed Call
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Auto Dial	8	0	DN

M2616 model 23

Intended use: Advanced business telephone with message indication
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/NDD/HFA/FBD

Table 137
M2616 model 23

Feature	Key number position	Key number position	Feature
–	15	7	Speed Call
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Transfer	8	0	DN

M2616 model 24

Intended use: Advanced business telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Table 138
M2616 model 24

Feature	Key number position	Key number position	Feature
–	15	7	–
Auto Dial	14	6	Speed Call
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Transfer	8	0	DN

M2616 model 25

Intended use: Advanced business telephone with message indication and display

Assigned Class of Service options:

LNA/FNA/GPUA/MWA/ADD/HFA/FBD

Table 139
M2616 model 25

Feature	Key number position	Key number position	Feature
–	15	7	–
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Transfer	9	1	DN
Speed Call	8	0	DN

M2616 model 30

Intended use: Manager telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Table 140
M2616 model 30

Feature	Key number position	Key number position	Feature
–	15	7	Transfer
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Auto Dial	9	1	DN
Voice Call	8	0	DN

M2616 model 31

Intended use: Manager telephone with message indication
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/NDD/HFA/FBD

Table 141
M2616 model 31

Feature	Key number position	Key number position	Feature
–	15	7	Speed Call (personnel: 20)
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Voice Call	9	1	DN
Transfer	8	0	DN

M2616 model 32

Intended use: Manager telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Table 142
M2616 model 32

Feature	Key number position	Key number position	Feature
–	15	7	-
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Voice Call	9	1	DN
Transfer	8	0	DN

M2616 model 33

Intended use: Manager telephone with message indication and display
Assigned Class of Service options:
LNA/FNA/GPUA/MWA/ADD/HFA/FBD

Table 143
M2616 model 33

Feature	Key number position	Key number position	Feature
–	15	7	–
Auto Dial	14	6	Message
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Voice Call	10	2	Conference
Transfer	9	1	DN
Speed Call (personnel: 20)	8	0	DN

M2616 model 40

Intended use: Front desk console with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/CNDA/HFA/FBD

Table 144
M2616 model 40

Feature	Key number position	Key number position	Feature
–	15	7	–
Hot *	14	6	Speed Call (personnel: 20)
Control Class of Service	13	5	Ring Again
Message Registration	12	4	Pick-Up
Room Status	11	3	Forward
Message Cancellation	10	2	Conference
Message Indication	9	1	DN
Transfer	8	0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

M2616 model 50

Intended use: Nurses station telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Table 145
M2616 model 50

Feature	Key number position	Key number position	Feature
–	15	7	Transfer
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Hot *	9	1	DN
Group Call - Group 0 **	8	0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. Define them when you activate the set.

** Although group 0 is pre- defined in LD 18, you must assign extensions for this group when the telephones have been installed.

M2616 model 51

Intended use: Nurses station telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Table 146
M2616 model 51

Feature	Key number position	Key number position	Feature
–	15	7	Speed Call (personnel: 20)
Auto Dial	14	6	–
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Hot *	10	2	Conference
Group Call - Group 0 **	9	1	DN
Transfer	8	0	DN

* These keys are Hotlines to various Hotel and Motel services, such as Room service, and the front desk. You define them when you activate the telephone.

** Although group 0 is pre-defined in LD 18, you must assign extensions for this group when the telephones have been installed.

M2616 model 61

Intended use: Message center telephone
Assigned Class of Service options:
LNA/FND/GPUA/MWA/NDD/HFA/FBD

Table 147
M2616 model 61

Feature	Key number position	Key number position	Feature
–	15	7	Transfer
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Auto Dial	10	2	Conference
Message Cancellation	9	1	DN
Message Indication	8	0	DN

M2616 model 62

Intended use: Message center telephone with display
Assigned Class of Service options:
LNA/FND/GPUA/MWA/ADD/HFA/FBD

Table 148
M2616 model 62

Feature	Key number position	Key number position	Feature
–	15	7	–
Auto Dial	14	6	Speed Call (personnel: 20)
Auto Dial	13	5	Ring Again
Auto Dial	12	4	Pick-Up
Auto Dial	11	3	Forward
Message Cancellation	10	2	Conference
Message Indication	9	1	DN
Transfer	8	0	DN

Changing pre-programmed data

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General information

The pre-programmed data on the Option 11C system can provide an effective starting point for programming the system’s telephone and trunking information.

This chapter shows how to change the default Option 11C numbering plan. You may want to change the numbering plan for one or more of the following reasons:

- to change the first number in the numbering plan
- to shift the start of the numbering plan to another card slot
- the default numbering plan interferes with the system data.

In addition to making changes to the default numbering plan, this section provides information about modifying model telephone and trunk programming stored in the Option 11C pre-programmed data.

Changing the default numbering plan

For improved performance refer to the Option 11C Survivability Guide (P0919734) for numbering plan configuration.

Extensions assigned differ from the default numbering plan

Compare the first digits assigned to this system with the default numbering plan as shown in the “Default numbering plan” on page 315.

- If the first digit is in the unused range, change the first number in the default numbering plan. To do this, follow the instructions in the section of this chapter called io.
- If the first digit is being used by Meridian Mail, trunk routes, or other data, you must remove these interferences. Follow the instructions found later in this chapter in the section called“Removing numbering plan interferences” on page 392.

Changing the first number in the numbering plan

To change the first number in the numbering plan perform the following procedure:

Procedure 54
Changing the first number in the numbering plan

1. **Pick up the handset of the administration telephone.**
2. **Enter the administration Flexible Feature Code.** (For some countries, this value is listed in the “Flexible Feature Codes” on page 324.)
3. **Enter the administration telephone password.** (For some countries, this value is listed in the, “Passwords and codes” on page 315**.)**
4. You hear special dial tone and the prompt “TASK?” appears on the top line of the character display.
5. **Press the asterisk (*) three times.**

   The second line of the character display reads “4 INSTALLATION OPTIONS'”.

6 **Select “4 INSTALLATION OPTIONS” by entering the number “4”.**

The character display reads:

1 DEFAULT SETS

2 NUMBERING PLAN

7 **Select “2 NUMBERING PLAN” by entering the number “2”.**

The character display reads:

FIRST NUMBER (XXXX)?

8 **To create a new first number, enter the digits you want and press the pound key.**

9 The number you enter as the first number in the numbering plan is assigned to slot number one, unit zero of the main cabinet. The default numbers assigned to the remaining card and unit combinations are consecutive in the Option 11C system assuming that each slot consists of up to 16 units.

Determining new extension numbers

If you wish to change the default numbering plan, and need to determine the extension number that will be assigned to a specific telephone, perform the following procedure:

Procedure 55
Determine the extension number

1 Identify the line card to which the telephone is connected. Take the card slot number associated with the card and subtract 1.

2 Multiply this number by 16.

3 Add the first extension number in the new numbering plan.

4 Identify the unit number the telephone is terminated on and add it to the result obtained in step 3.

Example:

Assume the new numbering plan starts at extension number 4500. You wish to know the extension number of the telephone connected to card 8, unit 12:

1	Subtract 1 from the card slot number (8-1):	= 7
2	Multiply by 16:	x 16 =112

3 Add the first extension number: +4500

4 Add the unit number: + 12
Number assigned to card 8, unit 12 is 4624

> ***Note:*** If you are using a three digit numbering plan, follow the same procedure.

Example:

The new three digit numbering plan starts at extension number 300, and you wish to know the extension number of the telephone connected to card 8 unit 12:

1 Subtract 1 from the card slot number (8-1): = 7

2 Multiply by 16: x 16
=112

3 Add the first extension number: + 300

4 Add the unit number: + 12
Number assigned to card 8, unit 12 is 424

If you want the system to have a consecutive numbering plan, make sure that the line cards are in consecutive card slots in the Option 11 cabinet.

If the line cards are arranged consecutively, the pre-assigned telephone extensions are automatically configured during telephone activation, and you do not have to manually enter them.

Using the Meridian Mail auto-configure feature

The Meridian Mail auto-configure feature automatically matches up Meridian Mail mail boxes with telephone extensions. If you have the Meridian Mail card option and you want to use the Meridian Mail auto-configure feature, make sure of the following:

- The numbering plan is consecutive
- The first number in the Option 11 system and the Meridian Mail system are the same.

Shifting the numbering plan to a new card slot

The first number in the numbering plan is assigned to slot 1, unit 0. You may wish to shift the first number in the numbering plan to a different card slot, since the TDS/DTR card is pre-programmed for slot 1.

The following procedure describes how to shift the first number in the numbering plan to a specific card slot.

Procedure 56
Shift the first number in the numbering plan to a different card slot

1 Locate the first line card. Subtract 1 from the card slot number it is housed in.

2 Multiply this number by 16.

3 Take the first number in the numbering plan and subtract the value obtained in step 2.

Note: When you enter the value from step 3 in response to the prompt "FIRST NUMBER (XXXX)?" on the administration telephone menu, the number is shifted to the appropriate slot.

Example:

The first number in the numbering plan is 2200. If you want the first number in the numbering plan to be 2300, and the first line card is located in slot 6, you will carry out the following calculation:

1 Locate the first line card. Subtract 1 from the card slot number it is housed in.

6 - 1 = 5

2 Multiply the number obtained in step 1 by 16:

5 X 16 = 80

3 Subtract this number from the first number in the numbering plan:

2300 - 80 = 2220

4 Enter this value in response to the "FIRST NUMBER (2200)?" prompt on the administration telephone:

FIRST NUMBER (2000)? 2220

Removing numbering plan interferences

This section contains various methods of removing any numbering plan interferences that may occur.

Interference with Meridian Mail data

The Option 11 system is shipped with pre-programmed data to support a Meridian Mail card option. The pre-programmed Meridian Mail data may cause problems in the following situations:

- there is a numbering plan conflict with pre-programmed Meridian Mail data and the programming required for another feature
- card slot 10 is required for another circuit card.

Obtaining the use of card slot 10

If card slot 10 is required for another circuit card, simply remove the six Meridian Mail agents programmed for this card slot. To do this, load LD 11 on the TTY and respond to the system prompts as shown below. Repeat the procedure once for each of the six units that you want to remove.

LD 11

```
REQ     OUT <CR>

TYPE    2008 <CR>

TN  10 XX <CR> “XX” = a value of 0,1,2,8,9, or 10
```

Obtaining the use of Meridian Mail ACD queues

The Meridian Mail feature also uses a number of ACD queues in the Option 11 system. Refer to the section of this chapter called “Interference with ACD queues” on page 393 for information on how to remove this data from the system.

Interference with ACD queues

The Option 11C has pre-programmed ACD queues for Meridian Mail, the Central Answering Position, and general purpose ACD. (For some countries, pre-programmed ACD queues are listed in “Important extension numbers” on page 318.) To remove these values, use LD 23.

> ***Note:*** Before you remove this data from the system, make sure that all ACD agent information is removed from the queue.

In LD 23, respond to the prompts as follows:

LD 23

REQ OUT

TYPE ACD

CUST 0

ACDN XXXX "XXXX" = Value of ACD queue

Repeat for each ACD queue you wish to remove.

Interference with Call Park extension numbers

System call park extension numbers are pre-programmed for the Central Answering Position. (For some countries, the default call part extensions are listed in "Important extension numbers" on page 318.) To remove this data from the system, load LD 50 and respond to the prompts as follows:

LD 50

REQ OUT

TYPE CPK

CUST 0

SPDN XXXX "XXXX" = Value of Call Park extension

Repeat for each Call Park extension you wish to remove.

Interference with SDI ports

Five SDI/ESDI ports are pre-programmed on the Option 11 system. Ports 8 and 9 are associated with the Meridian Mail card option, and ports 0, 1 and 2 are associated with the NTDK20 Small System Controller (SSC) card. Port 0 is associated with SSC card and cannot be removed. Any of the remaining ports can be removed using LD 17 as follows.

LD 17

REQ CHG

TYPE CFN

ADAN OUT TTY X “X” = the TTY that you are removing.

Interference with the SPRE code

If the pre-programmed SPRE code interferes with the programming required for the Option 11 system, use LD 15 to remove it. (For some countries, the default SPRE access code is listed in “First digits” on page 316.) For customer 0 enter the following in response to the SPRE prompt:

LD 15

SPRE Xy “y” = the value of the SPRE code

> ***Note:*** To define a new SPRE code, type a space and enter the new number.

Interference with the attendant extension number

You cannot remove the attendant extension number entirely from the Option 11 system data; you can only replace it with another number.

LD 15

REQCHGCHG = Change

TYPECDBCDB = Customer Data Block

CUST x “x” = Customer number

.

ATDN xxxx “xxxx” = the new extension number

Changing or removing the pre-programmed night number

For some countries, the default value of the night number is listed in “Important extension numbers” on page 318. If you wish to change or remove the night number, use LD 15.

LD 15

REQ CHG CHG = Change

TYPE CDB CDB = Customer Data Block

CUST x “x” = Customer number

NIT1 bbbb, or X aaaa “bbbb” = the new extension number (DN)

Or

“aaaa” = the current night number
(the night number is now removed).

Interference with Flexible Feature Codes

If the pre-programmed Flexible Feature Codes interfere with the programming required for the Option 11 system, use LD 57 to remove the data from the system. (For some countries, default FFCs are listed in “Flexible Feature Codes” on page 324.)

LD 57

To change one or more access codes, type in the following commands:

REQ	CHG, END	Change or end
TYPE	FFC	FFC = Flexible feature codes
CUST	0-31	Customer Number
FFCT	YES,(NO)	FFC Confirmation tone
CODE	aaaa	Enter access code prompt (aaaa)
AAAA	xx	Enter the new access code prompt (AAAA)
CODE	<CR>	Return to REQ
REQ	END	End program

To remove one access code, type in the following commands:

REQ	OUT	Action request
TYPE	FFC	FFC = Flexible feature codes
CUST	0-31	Customer Number
FFCT	YES,(NO)	FFC Confirmation tone
ALL	NO	Remove specific access code
CODE	aaaa	Enter access code prompt (aaaa)
AAAA	xx	Enter the new access code prompt (AAAA)

CODE	<CR>	Return to REQ
REQ	END	End program

To remove all access codes, type in the following commands:

REQ	OUT	Action request
TYPE	FFC	FFC = Flexible feature codes
CUST	0-31	Customer Number
FFCT	YES,(NO)	FFC Confirmation tone
ALL	YES	Remove all access codes
CODE	<CR>	Return to REQ
REQ	END	End program

Creating, changing, and removing model telephones

If you need a model telephone different from the default models provided in Option 11C software, use overlays to design your own models using the information in the following table:

Table 149
Design your own models

Task	Overlay
Create your own model telephones:	
Analog telephones (500/2500 type telephones)	LD 10
Digital telephones	LD 11
Get information on model telephones	LD 20 (printout)

If you require additional assistance when creating your own model telephones and trunks, refer to the Option 11C *Software guides* that are shipped with every system.

Creating analog telephone models

The following information must be entered in LD 10 in order to create an analogue (500/2500- type) telephone model:

LD 10

REQ NEW

TYPE 500 M

MODL YYY “YYY” = the model number of the telephone that you are creating

Enter responses to the remaining prompts in order to complete the new model. (Refer to the Option 11C *Software guide*s for a complete list of prompts and possible responses).

Modifying analog model telephones

If you want to modify an analog telephone, use LD 10 and type in the following commands on the TTY:

LD 10

REQ CHG

TYPE 500 M

MODL YYY “YYY” = the model number of the telephone that you are modifying

For more information about LD 10 and its associated prompts and commands, refer to the *Option 11 Software Guides* that are shipped with the system.

Creating digital model telephones

When you create model telephones for digital telephones, you must program key 0 with a function that can act as a prime extension number or its equivalent. This includes telephones that are programmed to have Single Call Ringing (SCR), Multiple Call Ringing (MCR), Single Call Non-Ringing (SCN), Multiple Call Non-Ringing (MCN), and Automatic Call Distribution (ACD).

For ACD telephones, the model telephone defines the ACD queue. To define the extension number, you must enter the ID number of the agent or the Central Answering Position.

The following information must be entered in LD 11 in order to create a digital telephone model:

LD 11

REQ NEW

TYPE 2XXX M or 3000 M “XXX” = allowed telephone types

MODL YYY “YYY” = the model number of the telephone that you are creating (between 1 - 127)

Enter the responses to the remaining prompts in order to complete the new model. (Refer to the Option 11C *Software guides* for a complete list of prompts and possible responses).

Modifying digital model telephones

If you want to modify a digital telephone, load LD 11 and type in the following commands on the TTY:

LD 11

REQ CHG

TYPE 2XXX M or 3000 M “XXX” = allowed telephone types

MODL YYY “YYY” = the model number of the telephone that you are modifying

For more information about LD 11 and its associated prompts and commands, refer to the Option 11C *Software guides* that are shipped with the system.

Printing model information

To print information about model telephones, use LD 20.

Analog telephones

LD 20

```
REQ PRT

TYPE 500 M

MODL YYY “YYY” = the telephone model number.
          If you want to print all of the models for
          this telephone type, leave this value blank.
```

Digital telephones

> ***Note:*** To print M3000 telephone models, you must enter “TYPE 3000 M”. If you enter “TYPE 2XXX M”, you print all the Meridian Digital Telephone models except the M3000.

LD 20

```
REQ PRT

TYPE 2XXX M or 3000 M “XXX” = the telephone type

MODL YYY “YYY” = the telephone model number
           (between 1 - 127) If you want to print all
           of the models for this telephone type, leave
           this value blank.
```

Removing model telephones

Use LD 10 to remove analog telephone models and LD 11 to remove digital telephone models. Respond as follows to the prompts in either overlay:

LD 10 or LD 11

```
REQ      OUT
```

TYPE XXXX M "XXXX" = telephone type for the model you are removing (Example: 500, 2006, 2317, 2216, 3000, etc.)

CUST 0

MODL YYY "YYY" = the model number associated with the telephone type you are removing (Valid range is 1-127).

Creating model trunks and changing route access codes

If you need a trunk that is different from the default models provided in Option 11 software, use overlay 14 to design your own models. Route access codes are changed using the administration telephone.

If you require additional assistance when creating your own model telephones and trunks, refer to the Option 11 *Software guides* that are shipped with every system.

Creating model trunks

To create a new model trunk, load LD 14 and type in the following commands on the TTY:

LD 14

REQ NEW

TYPE aaa M "aaa" = the type of trunk that you are creating (TIE, COT, WATS, and so on).

MODL YYY "YYY" = the model number of the trunk that you are creating (between 1 - 127)

XTRK XUT, XEM, XCOT, XDID This prompt only appears when you define the first model in a group. Each group consists of 16 consecutive model definitions. (Refer to the group boundaries listed below.) Once the first model in a group is defined, the remaining model numbers in the group(s) are assumed to be of the same type.

Group boundaries are as follows:

1-15, 16-31, 32-47, 48-63, 64-79. 80-95, 96-111, 112-127.

Examples:

If, for example, you define a model trunk as XUT, with a model number of 12, all models in the group 1-15 will automatically be XUT models. If you define another model trunk as an XEM, with a model number of 33, all models in the group 32-47 will automatically be XEM models.

> ***Note:*** When you create trunk models you are not prompted for the trunk route or member number. This information is defined by using the administration telephone to program the XUT or XEM circuit card.

For more information about LD 14 and its associated prompts and commands, refer to the Option 11 *Software guides* that are shipped with the system.

Modifying model trunks

If you want to modify a trunk, load LD 14 and type in the following commands on the TTY:

LD 14

REQ CHG

TYPE aaa M “aaa” = the type of trunk that you are modifying

MODL YYY “YYY” = the model number of the trunk that you are modifying (between 1 - 127)

Removing model trunks

To remove a trunk model from the system, load LD 14 and respond to the prompts as follows:

LD 14

REQ OUT

TYPE XXX M “XXX” = the trunk type of the model that you are removing (Examples: COT, TIE, DID, FEX, WAT, etc.)

CUST 0

MODL YYY “YYY” = the model number associated
with the trunk type you are removing
(Valid range is 1-127).

Printing model information

To print information about model trunks, load LD 20 and type in the following commands on the TTY:

LD 20

REQ PRT

TYPE TTTT M “TTTT” = the trunk type

MODL YYY “YYY” = the model number. If you want to print all of the models for this trunk type, leave this value blank.

Changing a route access code

Use this procedure to change a route access code.

Procedure 57
Changing a route access code

1. **Pick up the handset of the administration telephone.**
2. **Enter the administration Flexible Feature Code to access the administration menu. (For some countries, this value is listed in “Flexible Feature Codes” on page 324.)**
3. **Enter the default administration telephone password. (For some countries, this value is listed in “Passwords and codes” on page 315.)**

You hear special dial tone and the prompt
"TASK?"
appears on the top line of the character display. If you press the asterisk, "2 CHANGE ROUTE ACCESS" appears on the second line of the character display.

4 **Select "2 CHANGE ROUTE ACCESS" by entering the number "2".**

The prompt
"ROUTE ACCESS?"
appears on the character display.

5 **Enter the access code of the route to be modified and press the pound key (#).**

The prompt
"NEW ACCESS CODE?"
asks you for a new access code for the route.

6 **Enter the new access code and press the pound key.**

The display shows
"CODE CHANGED".
After a delay of approximately 4 seconds you hear special dial tone and the sequence is repeated when the prompt
"ROUTE ACCESS?"
appears.

OR

If the route access code is not available for use, you hear overflow tone.

The display shows
"USED, ROUTE ACCESS?"
and you must repeat this step.
You must enter a **different** access code. This sequence continues until you enter an appropriate new access code.

7 **Terminate the sequence by hanging up the telephone, or**

Repeat the sequence by going through the steps again.

Expansion cabinet as a power shelf for auxiliary processors

Contents

This section contains information on the following topics:

General information 405

Expansion cabinet used as a power shelf 405

General information

This chapter contains the procedure for adding a cabinet to be used as a stand-alone power shelf for Aux processor units (such as Max IPE).

Expansion cabinet used as a power shelf

Follow this procedure to add an expansion cabinet used as a power shelf for auxiliary processor units.

Procedure 58
Expansion cabinet as a stand-alone power shelf

1 **Locate the carton containing the expansion cabinet. Install it as described in “Mounting the cabinets” on page 115.**

- Make sure that it is mounted according to the plan.
- Make sure that it is securely mounted.
- Make sure that the pedestal is properly installed if the cabinet is to be mounted on the floor.

2 **Make sure that the AC power cord is disconnected from the power outlet.**

3 **Install a #6 AWG (# 40 Metric Wire Gauge) ground wire from the cabinet to a ground source (the ground bus in the AC power service panel).**

Note: Do not connect the ground wire to the ground connection in an existing Option 11C cabinet. The ground wire must be connected to the ground source.

WARNING

The connection in the AC power service panel should be performed by a qualified technician or electrician.

Connect the ground wire to the ground lug located in the bottom of the cabinet next to the cable connectors.

Route the ground wire through the third groove from the left in the bottom of the cabinet.

Connect it to the Single Point Ground (SPG) and place a DO NOT DISCONNECT tag on it.

Note: Refer to the Option 11C “Grounding requirements” on page 39.

4 **Put on the wrist strap provided in the bottom of the cabinet and install the power supply with the circuit breaker at the OFF position. If this is an AC powered system, plug in the power supply cord in the commercial power supply receptacle and into the power supply. Refer “Installing the power supplies” on page 131.**

CAUTION

A grounded wrist strap, provided with the cabinet, must be worn when handling circuit cards to prevent damage caused by static electricity.

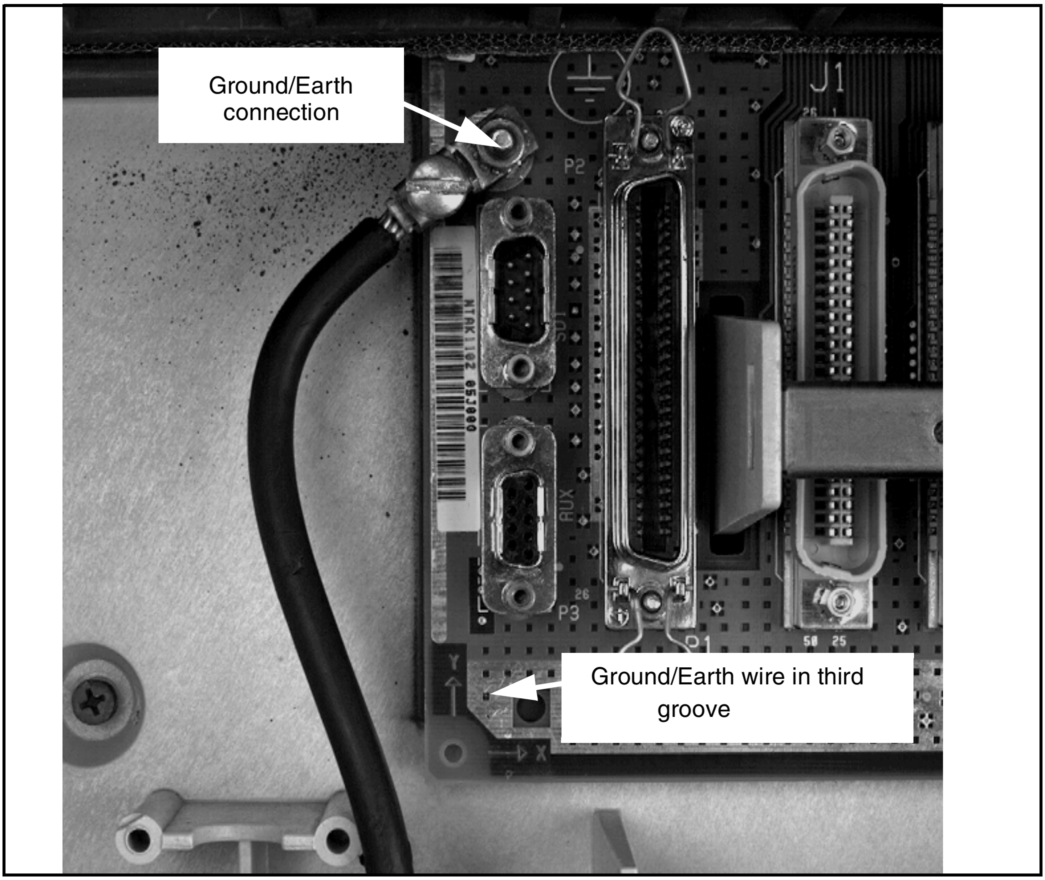
Make sure that the NTAK04 or NTDK78 AC/DC or NTAK05 or NTDK72 DC power supplies are installed and that their circuit breakers are set to OFF.

5 **Refer to the ACD Max documentation to complete the installation of the Max units and related cables.**

Connectors for the cables in the expansion cabinet are located on the panel below the cabinet's shelf. Refer to “Installing and connecting cross-connect terminals to cabinets” on page 169 for information about connection cables to the cabinet.

Note: The slots in the expansion cabinet are labeled 11 through 20. The corresponding connectors for cables are labeled J11 through J20 or J1 through J10, depending on the type of cabinet.

Figure 99
Ground/Earth connection



Meridian 1

Option 11C

Planning and Installation Guide

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